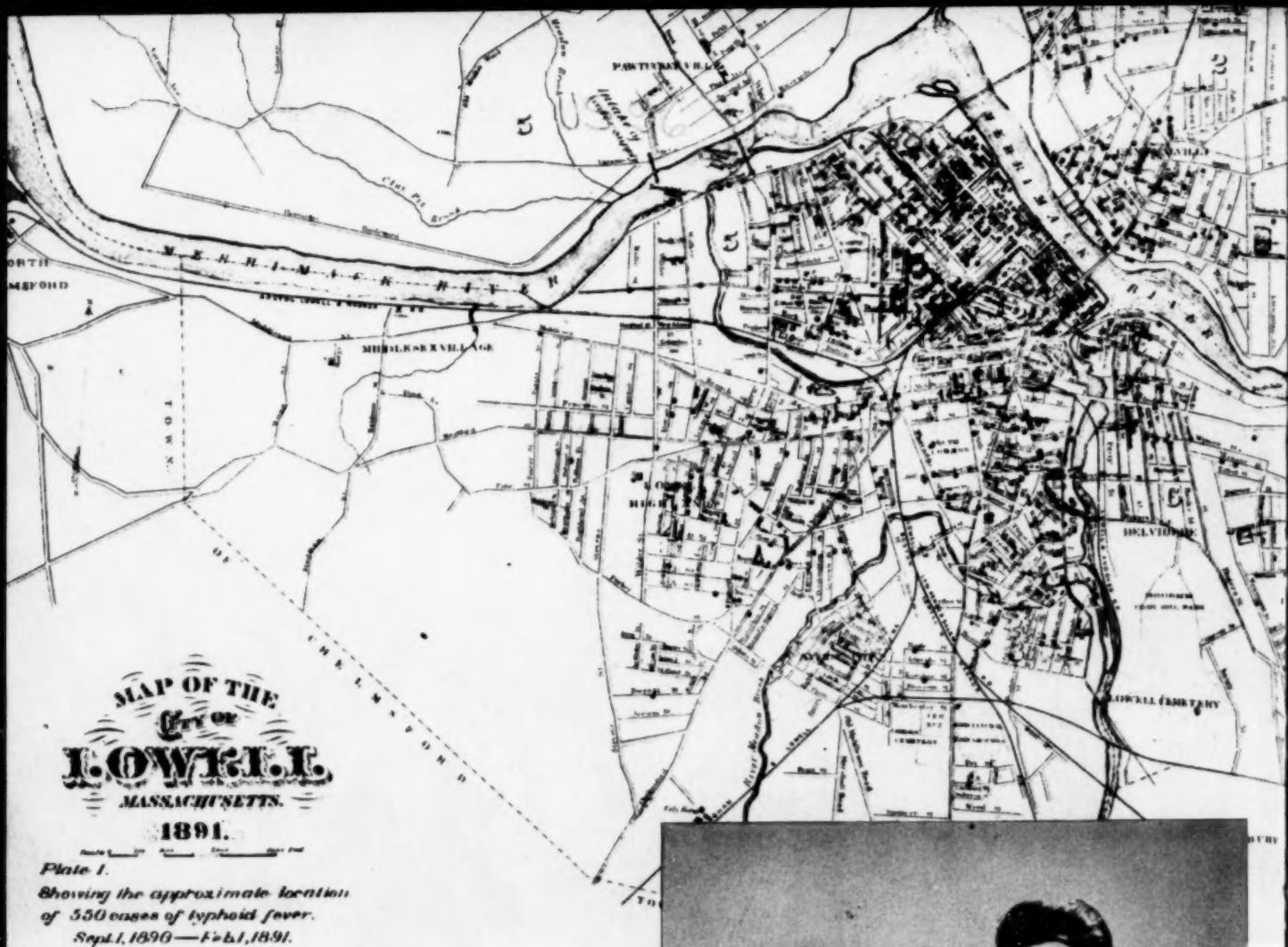


PUBLIC HEALTH REPORTS

In this issue



FEDERAL SECURITY AGENCY • Public Health Service



80 years of public health

In little more than the Biblical span of life—from the days of the founding of the American Public Health Association and early grapplings with the communicable diseases to a time of confidence that we can add "life to years"—the sciences of public health have played a major and continuing role in transforming and enriching human destiny.



see overleaf and special section

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PUBLIC HEALTH REPORTS

Published since 1878

Contents

	Page
Public health statesmanship----- <i>Leonard A. Scheele.</i>	1
The prevention of rheumatic fever-----	12
A community program for the prevention of rheumatic fever recurrence----- <i>Mary Alice Smith.</i>	16
Employment of the older worker----- <i>Theodore G. Klumpp.</i>	20
Tuberculin sensitivity in Alaska----- <i>Edward S. Weiss.</i>	23
Complement fixation tests for murine typhus on small mammals----- <i>Ruth Keaton, Billie Jo Nash, J. N. Murphy, Jr., and J. V. Irons.</i>	28
Provisions of State laws governing local health departments----- <i>Clifford H. Greve.</i>	31
Abatement of stream pollution caused by industrial wastes—The fundamental sciences vs. rule-of-thumb----- <i>Rolf Eliassen.</i>	43
The movement toward sound drug therapy-----	46
An objective approach to drug therapy----- <i>J. Solon Mordell and C. K. Himmelsbach.</i>	47
Four health education evaluation studies-----	54
Antimalarial activity of 4,000 compounds-----	56
Radiation exposure in the United States----- <i>Dade W. Moeller, James G. Terrill, Jr., and Samuel C. Ingraham, II.</i>	57
Chemical labeling committee reactivated-----	66
United States vital statistics, 1951-52-----	68
Birth statistics in maternal and child health programs----- <i>William Haenszel.</i>	71
Practice of public health, 1952—Part I-----	81
The APHA Conference report . . . 82. Control of chronic illness and efforts in rehabilitation . . . 83. Community organization for health: practice and precept . . . 86. New	

Continued ►

55

On the origins of the

American Public Health Association

1872-1873

ON THE 18th of April 1872, an informal conference of a number of gentlemen, who for several years had been in some degree co-workers in the studies of Preventive Medicine and in duties of public sanitary service, was held in the city of New York, with the design to secure concerted effort, and establish some adequate plans in the cultivation of hygienic knowledge, and procuring more effective applications of sanitary principles and laws. . . .

The first meetings of the Association have resulted in the cheerful contribution of reports and papers upon important sanitary questions, rather than in voluble debates; the rich fruit of careful observation and study, comprehensive surveys relating to epidemics and other diseases, and logically studied truths which are required for the basis and structure of true sanitary science and for the most effective methods and proceedings in public health administration. . . .

The golden maxim of Franklin that "Public Health Is Public Wealth," is obviously true in all communities, but the same maxim now finds a higher significance in the ascertained relationship of sound and vigorous health to the social and moral interests of individuals, families, and nations.

The chief problems of civilization and humanity now demand their solution upon a basis of most exact and compre-

hensive knowledge of facts reduced to the deductions and formulas of science, and it is not arrogating unreasonable functions for the principles and the public applications of sanitary science, to say that the physiological health of the people so far underlies soundness and sufficiency of mental culture that hygiene will have to be recognized as a fundamental element of success in common education and in the higher culture, as well as in the practical solution of the great social and moral problems of our times. . . .

In this volume of Sanitary Papers the records of two deadly epidemics—the fatal strides of cholera in the great valley west of the Alleghenies, and the invasion of Shreveport and Memphis by yellow fever when those cities were utterly defenseless, unguarded, and un-

Continued on page 82.

frontispiece

The map of Lowell, Mass., is from William T. Sedgwick's report "On Recent Epidemics of Typhoid Fever in the Cities of Lowell and Lawrence Due To Infected Water Supply . . ." published in the 24th Annual Report of the State Board of Health of Massachusetts, for the year ending September 30, 1892. The family group is from the Public Health Service's 1952 APHA exhibit (see special section, page 81 ff.).

Contents for January, continued

research, service roles for the bacteriologist . . . 90. Experience with home care in four large cities . . . 92. Cancer control projects and research activities . . . 95. Laboratory—epidemiological reports from overseas . . . 99. Working links between hospital, private, State laboratories . . . 103. Prevention of poliomyelitis with gamma globulin and vaccine . . . 105. New methods and approaches in laboratory techniques . . . 108. Tuberculosis control problem and modern therapy . . . 112. Government, industry, labor in industrial hygiene . . . 115. Methods of administration in medical care plans . . . 118. Scientific, group, and community approaches to obesity . . . 124. Cooperative group action by parents of the handicapped . . . 127. Studies of spread patterns of infectious hepatitis . . . 130. The general practitioner and preventive medicine . . . 132. "Advancing the frontiers of public health" . . . 134. Field, laboratory, and legal approaches to treponemata . . . 136. Professional training for pediatricians and nurses . . . 138.

Short reports and announcements:

Frontispiece . . . ii. Origins of APHA . . . ii. PHS publications . . . 140. International certificate requires stamp . . . 11. Epidemiology course for nurses . . . 15. Indexes for 1952 . . . 27. PHS staff announcements . . . 30. Children's Bureau appointments . . . 53. Sources of morbidity statistics . . . 55. Diphtheria in the U. S. . . . 67.

Published concurrently with this issue:

PUBLIC HEALTH MONOGRAPH No. 8 Pretesting and evaluating health education.

Andie L. Knutson, Benjamin Shimberg, Jane S. Harris, and Mayhew Derryberry.

25 pages. A summary and information on availability appear on pages 54-55.

PUBLIC HEALTH MONOGRAPH No. 9 Survey of antimalarial agents: Chemotherapy of *Plasmodium gallinaceum* infections; toxicity; correlation of structure and action.

Robert G. Coatney, W. Clark Cooper, Joseph Greenberg, and Nathan B. Eddy.

323 pages. A summary and information on availability appear on page 56.



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Public Health Statesmanship

By LEONARD A. SCHEELE, M.D.

I HAVE NOT the slightest hesitancy in announcing that I have plagiarized the title of this lecture: Public Health Statesmanship. It seems fitting, however, to inaugurate the Winslow Lectures with some reflections on this quality, this profession, this art of statesmanship—because Professor Winslow himself has exercised it in thought, word, and deed throughout his career.

In a symposium on Public Health Statesmanship at the University of Pennsylvania Bicentennial Conference in 1941, a symposium in which Professor Winslow participated, Dr. Parker Hitchens (1) quoted an unidentified passage which I wish to propose as the text of our discussion:

"History shows that great economic and social forces flow like a tide over communities only half conscious of that which is befalling them. Wise statesmen foresee what time is bringing and try to shape institutions and mold men's thoughts and purposes in accordance with the change that is silently coming."

This description of statesmanship gives us a good plumline for our discussion. Note how it views the statesman as an embodiment of creative thought and action. Even the metaphor brings to mind a creative personality—

Dr. Scheele is Surgeon General of the Public Health Service. This paper, the first Charles-Edward Amory Winslow Lecture, was delivered at Yale University on November 14, 1952.

the potter, guided by his vision, shaping and molding the clay.

This description also asks us to ascribe historical perspective to the statesman as one of his essential qualities. And, finally, it gives a central position in the arena of statesmanship to the economic and social forces which ultimately shape the course of events.

Criteria of Statesmen

Creativity—historical perspective—and recognition of economic and social change: We need especially to emphasize these criteria in our consideration of statesmanship in public health. The members of the public health profession come from many scientific disciplines. As professional workers, we tend to place the highest values on our technical knowledge and skills. But as statesmen, we are challenged to be something more than good technicians.

As technicians, we are called upon day after day to apply our special competence to problems of bewildering complexity. As statesmen, we are challenged to learn whence these problems sprang, to trace their deep, far-reaching roots, and to learn how other men have viewed the health problems of their day. In public health, each man's sphere of direct action may be narrow—confined by the limited reach of his individual technology. As statesmen, we are challenged to see the inseparability of our sphere from the countless interacting forces of society—and, having seen, to think and act as statesmen.

Professor Winslow's response to this challenge is woven into the fabric of public health throughout the world. I have more than a

spectator's reason for saying this. Recently, I have had occasion to dig into the story of public health in the past hundred years. As I picked up one thread after another and began to ravel it back to its origins, I found that Professor Winslow had been there before me as historian, as scientist, administrator, teacher, as prophet or philosopher.

Following such a leader, I find it difficult to bring you any original concepts of public health statesmanship. Nor does the subject lend itself to the closely reasoned development of a single theme, as would some technical aspect of public health. We are dealing instead with a kaleidoscope—the kaleidoscope of public health in the modern world. The same bits and pieces of modern society present themselves to us in an endless variety of patterns and problems. Our reflections, then, will be kaleidoscopic.

There is another difficulty. To discuss statesmanship is to discuss a human function. And it is a function fraught with the resolution of dilemmas, the making of decisions, and the exercise of wisdom, dedication, and leadership. These virtues are possessed in varying degree and are exercised consistently only by the uncommon man. Yet we of the public health profession must reflect upon statesmanship, must discuss it, and exercise it to the highest degree of which we are capable. For this is a period of history in which public health progress depends more upon the quality of our statesmanship than upon the specificity of our techniques.

I do not mean that our techniques are adequate to the solution of all our problems; nor that public health can relax for an instant its scientific effort for the discovery and development of better methods. Far from it. Nearly a century of organized public health work has proved the direct correlation of success with scientific advance and its resultant specificity of techniques. As public health progress has been based primarily upon the professional application of the biological and mechanical sciences in the past, so it will be in the future.

Nevertheless, the tide of events runs strongly in directions that should alert us to the challenge of statesmanship. America has entered a period of social evolution unlike any we have experienced hitherto.

The most obvious, and perhaps most potent,

difference is America's position of leadership in the free world—a leadership which carries heavy responsibilities affecting every phase of our society and economy. It has not been easy for us to endure with patience the effects of prolonged mobilization. It has not been easy for us to accept the urgency of our defense problems or to learn the art of persuading other peoples to the benefits of mutual security and the principles of democracy. These are new experiences for us; yet they are essential for survival in a world threatened by Soviet imperialism.

Socioeconomic Elements

The economy itself is working in unfamiliar directions. I say "unfamiliar" because many people forget that the depression of the thirties is 20 years behind us, and that the pattern for solution of public health problems in the future is likely to be different from that of the past 20 years. Reasonable pressure for economy in governmental health programs is one of those forces that "flow like a tide over communities only half conscious of that which is befalling them." This will constitute a major challenge to our statesmanship. Public health programs will grow; but we must study needs, set priorities, plan better, and work harder.

Moreover, unemployment has reached a new low since World War II and American industrial production in September reached the highest point since 1945. Entirely new technologies have been added, or have replaced many pre-war methods of production. Even more recent technological developments will bring about other changes in production. In agriculture, mining, and manufacture, the productive capacity of the individual worker has been more than doubled since the turn of the century. This enhanced productivity, coupled with the increased purchasing power of labor, has sustained a steadily rising standard of living. There is, for example, a startling difference in the variety and amount of foodstuffs which can be purchased today with a much smaller fraction of the workman's earnings, than 25 years ago.

The effects of these broad socioeconomic changes on public health are manifold, exceedingly complex, and ramiform. We may think

of public health as a state of community well-being or as an institution created by society to protect and promote that state of well-being. Actually, it is both; but however we think of it, we are bound to recognize a continuously interacting relationship between the health of the people and the economy; and a similar reaction between public health practice and the society in which it functions. These interacting relationships determine in large measure the nature of our problems.

I have mentioned the kaleidoscopic patterns in which those problems present themselves. Yet there is an order and a unity of purpose in public health work which make it the great institution it is and which enable its disciples to serve the enviroing society with compassion, with dedication, and with a sense of partnership.

To understand this motivation, we do best to turn to a classic definition of public health which was formulated by Professor Winslow in 1920 and which has been so widely disseminated that it may now be called the charter of modern public health:

"Public health is the science and the art of preventing disease, prolonging life, and promoting physical health and efficiency through organized community efforts—for the sanitation of the environment, the control of community infections, the education of the individual in principles of personal hygiene—the organization of medical and nursing services for the early diagnosis and preventive treatment of disease—and for the development of the social machinery which will ensure to every individual in the community a standard of living adequate for the maintenance of health" (2).

Thirty-two years later, the Expert Committee on Public Health Administration of the World Health Organization adopted this definition as the basis of their discussions—with two minor changes which have a distinct Winslow flavor (3). They recognized an expanded concept of health education and changed "personal hygiene" to "personal and community health." Here at Yale, public health found

the early expression and practice of this modern concept of community health organization and education, as well as many of its first recruits to the new group of health educators trained in that concept.

The WHO committee also added this phrase: "so organizing those benefits as to enable every citizen to realize his birthright of health and longevity." We hear in those words the echo of many a plea by Professor Winslow for a higher level of health than the absence of disease and for the universal application of public health benefits.

In our charter, then, public health workers may find many opportunities for statesmanship both in our most familiar programs and in those less familiar. Let us consider a few of them.

Environmental Health

Control of environmental hazards is one of the oldest public health functions. With a few notable exceptions, which I shall refer to later, that effort has been directed to the prevention of communicable diseases. Many of the traditional sanitary practices of public health are now quite commonplace. In fact, they are too much taken for granted. Yet as they developed, in their time, many a public health pioneer, a public health statesman, fought uphill battles against ignorance and fear to gain better understanding and acceptance of public health practice in the community.

Americans are living in an environment quite different from that of 50 years ago—or, for that matter, even 10 years ago. Public health can no more ignore this new environment as a possible source of ill health than our professional ancestors could ignore the environment of their times as a source of devastating epidemics. Moreover, we now think of the environment in a wider dimension—to include social and psychological factors along with the physical. The incidence of fatal and disabling accidents, for example, calls for the study of all these factors. The relationships of environment with mental health and such chronic ailments as heart disease, cancer, arthritis, and rheumatism also must be investigated.

Public health statesmanship requires that we recognize the health components in the new

environment. Often they go unchallenged, not only by the persons directly concerned with creating new environmental situations, but also, regrettably, by public health personnel.

The Chemical Environment

None of us, for example, can escape the influence of chemicals on our daily living. For the most part, that influence has been beneficial to a high degree. But in the field of public health, we are beginning to see clouds upon the horizon, literally. The problem of air pollution is no longer confined to our work places or to our largest industrial centers, but is a potential threat to health even in semirural communities where industries, domestic heating systems, and climatic conditions combine to produce serious "smogs."

It is significant to our reflections on public health statesmanship that in 1912 the New York State Commission on Ventilation, of which Professor Winslow was a distinguished member, was appointed by the governor at the request of the New York Association for Improving the Condition of the Poor. The association put up \$50,000 for the work of the commission, especially in investigations of the relation of ventilation in tenements and schools to ill health.

In 1949, it was a local labor union that requested the Public Health Service to make a thorough study of the smog in Donora, Pa. Since that time, a number of community organizations have sought help in studying their air pollution problems.

Is it a measure of public health statesmanship that 40 years ago and again 3 years ago, it was not the official health agencies, but members of the society in which they function, who sought action in studying the health component of air pollution? If public health workers do not see beyond the performance of their prescribed routines; if they do not recognize the health implications of the new environment nor bestir themselves to interpret the problems to society, then we can say that their statesmanship in environmental health does not measure up.

Public health knowledge of chemical and radiation hazards began with the study and control of occupational diseases. Today the number of known substances, compounds, and

processes used in industry runs into the thousands and is being increased day by day. To what extent the industrial uses of chemicals and radioactive substances affects the health of the general population is not known with anything like the specificity of our knowledge of occupational hazards.

The addition of chemicals to many processed foods and the development of new physical techniques for the preservation and transportation of foods also require study. The Select Committee of the House of Representatives to Investigate the Use of Chemicals in Foods and Cosmetics held extensive hearings in the 82d Congress and it is clear from the committee's report that more research is needed to determine the effects of chemicals in foods on human health. It is not clear, however, what the relationships between government and industry should be in the conduct of such research and in the formulation and enforcement of standards. Here is another instance in which statesmanship is, at the present time, more important for solution of the problems than the specificity of existing science.

Water Resource Problems

The pollution of our inland waters by industrial wastes is one of the largest domestic problems facing this country. It involves our total economy and is a present threat to industrial expansion, agriculture, recreation, fish and wildlife, and public health. We are still far from understanding the new types of pollution, as well as from solving this growing problem. During the past 4 years, the Public Health Service has worked with State and interstate water authorities and industrial groups to stimulate research. We are cooperating also with the Atomic Energy Commission in studies of the disposal of radioactive wastes. The current work, however, on both chemical and radioactive pollutants is only a small beginning of what is destined to become a large field of public health research and control.

Statesmanship in this field requires involving all the interested groups. For public health workers, it also provides a fine opportunity not only to interpret the health component in water pollution to persons primarily concerned with some other problem, but also to recognize and

The Winslow Lecture

Dr. C.-E. A. Winslow (right) and Dr. Ira V. Hiscock (left), chairman of the department of public health at Yale, with Dr. Scheele on the occasion of the first of the annual lectures sponsored by the Yale public health alumni in honor of Professor Winslow.

Dr. Winslow is the Anna M. R. Lauder professor emeritus of public health at Yale and editor of the *American Journal of Public Health*. After training with Sedgwick, and with wide experience, he joined the Yale faculty in 1915 as chairman of the department of public health, retiring in 1945 after 30 years of service, during which he achieved international recognition as leader, teacher, and exponent of public health. In 1942 he received the Sedgwick Memorial Medal of the American Public Health Association "for distinguished service in public health." In 1952 he received a special Lasker Award from the Association, and the World Health Organization conferred upon him the Leon Bernard Foundation prize.



interpret the common interest of many diversified groups in the development and conservation of the Nation's water resources.

One of the valuable lessons we have learned is the greater efficiency of a team approach to the water resources problem. The team that public health statesmanship seeks, of course, is not a group composed solely of collaborating Federal agencies, but rather a group in which State agencies and others are fully participating members.

I cannot leave the problems of our chemical environment without reference to the fluoridation of public water supplies as a means of preventing dental decay. This is probably the first and only instance in public health to date in which a "mass sanitation" technique has been developed for the prevention of a noncommunicable disease.

The epidemiological studies of fluorine in natural water supplies and of artificial fluoridation have been classics. We in the Public Health Service have every reason to be proud of the work of some of our men in this field. Time will prove that this single discovery and development has been one of the great contributions to human health.

Like all innovations, fluoridation has met

with resistance. And it is this very resistance that calls for statesmanship. In responding to something new, people forget facts long since accepted. They forget, for example, that fluorine exists in small amounts in many animal and plant tissues such as are found in the average diet, as well as in many natural waters. We have had varied reactions, from enthusiastic acceptance to uncertainty about the ingestion of fluorine, and even unfounded fear of "poisoning" similar to the early fear of the chlorination of water supplies.

Our statesmanship here consists in convincing the skeptics that our epidemiological and laboratory studies are valid and that the benefits of fluoridation are not to be discarded lightly in the face of uninformed opposition. Convincing is an art, and it permits no arrogance or contempt of the opposition's point of view. In convincing, we must be completely candid and interpret the needs for more research in this field. One of the core facts of public health is the continuous search for techniques even more effective than those which we can endorse wholeheartedly at a given time. This is one of the most difficult facts to interpret to the average citizen and to appropriating bodies; yet this

task of interpretation is the very substance of our statesmanship.

Healthful Housing

There is one other environmental factor which as much as any other affects the solution of health problems as diverse as the control of heart disease, the promotion of mental health, and the prevention of acute infections. I refer to housing.

As Professor Winslow knows so well, as he has told us so many times, it is not enough that the American Public Health Association through his leadership has developed a remarkably accurate technique for evaluating the healthfulness of urban housing. Here is an instance in which the effectiveness of our techniques has exceeded the quality of our statesmanship.

Housing has been a major social problem of high priority throughout the world since before World War II. There has been tremendous enthusiasm and hope that housing and health agencies united could make substantial contributions to the solution of far-reaching problems affecting every family in the Nation. Yet few health departments have accepted their share of responsibility in working for more healthful housing.

At the present time, only 10 State health departments are actively assisting local health agencies in the development of housing programs. A few others have specific plans. Nearly 100 local health departments, however, have actively taken part in programs to improve housing conditions in the past few years. Only 13 States and 25 local health departments are conducting active programs in home accident prevention—closely related to housing. In States where progress has been made in either field, the responsibility for stimulating and assisting local activity has been delegated clearly to one staff member.

Statesmanship in the health aspects of housing calls for the active participation of local health agencies in community planning and the development of community housing programs. The fact that a city may have anywhere from 2 to 10 official agencies concerned with some phase of housing intensifies the challenge to be a public health statesman. The fact that some

States have official housing agencies invites State health authorities to step across the street and make known their interest and their willingness to cooperate in joint solutions of a major social problem.

Disease Control and Health Services

It is indeed a part of public health statesmanship to reach out in the community and identify those social and political forces that will make common cause with us for the solution of health problems whatever they may be. I warrant that many a public health worker in State and local agencies today would be agreeably surprised at the diversity and strength of the groups ready and eager for his leadership.

In this connection, we need to help our boards of health and county councils develop public health statesmanship attuned to society's current problems. Public health workers read, talk, and listen to seemingly endless conferences all emphasizing the shift in the age composition of the population, the increase in chronic diseases and impairments, the needs for community facilities and for the mobilization of community health resources. I regret to say that much of this healthy exchange of information is between those already converted to the cause; and in rare moments of discouragement I wonder how much of the discussion goes in one ear and out the other.

Chronic Disease and Disability

Chronic disease, chronic impairments, and the disabilities of old age are indeed the major health problems of America's aging population. Even with the widest possible latitude in interpreting the laws authorizing Federal grants-in-aid for general health services, maternal and child health, and services for crippled children, we cannot expect existing, and possibly shrinking, appropriations for these purposes to carry a forthright attack on chronic disease and the health problems of the aging. Here we must depend upon the special programs which have been made possible by the demands of society for action against the first causes of death and invalidism.

There is strong popular support for chronic

disease control and for health services to the aging. Yet I would be less than candid if I did not say that State and local health services in most of these fields are scanty and scattered. Lacks of sufficient funds, facilities, personnel, and effective medical techniques are commonly cited as causes of the lag in health department activity. Another deterrent frequently mentioned is the resistance of physicians to any public health activity in these areas. I am sure that this occurs because of failure to explain properly the programs to them.

The measure of our statesmanship, then, need not be in convincing society that chronic diseases and impairments are health problems of the first magnitude. Society has already given its mandate—and gives it year after year—in support of our programs and of the voluntary agencies devoted to these special problems. Rather the measure of our statesmanship will be in convincing the medical and community leaders, in convincing boards of health, county councils and other governing bodies, that these health problems are social and economic problems of the first magnitude and worthy of their full support and action.

Once the interrelationships of chronic disability, old age, and economic dependency are clearly understood, there is every reason to believe that general cooperation in the development of community programs, in which all physicians cooperate, for prevention, as well as for care of the chronically ill, will be forthcoming. The development of health services, especially preventive and restorative programs, aims to reduce dependency and the costs of public assistance and public medical care. The possibility of sound economy sharpens the humanitarian impulse for cooperation and adequate support.

If health officials continue to represent their needs and the community's needs as encompassing no more than the limited public health programs of prewar days, they cannot expect the medical profession, the boards, councils, mayors, governors, and legislatures to recognize the changing health needs or to select the issues which require priority in the formulation of public policy. Public health statesmanship, in many respects, consists in raising our sights, in applying our technical competence to health problems wherever they exist and are being neg-

lected. This implies, of course, that public health will also be self-critical, reviewing and appraising its own performance so that activities which no longer yield substantial benefits to the community will be modified or reduced in favor of more effort in neglected fields. It means also that public health must work more closely with the practicing physician and his organizations.

Promotion of Research

Scientific research has not yet given us the techniques we shall ultimately need for pinpointing the attack on chronic diseases or for developing a practical hygiene of the aging. At present, control of many chronic diseases is possible in the individual patient, but only through highly specialized skills and equipment. At present, medical rehabilitation of the disabled is possible in the individual patient, but only through specialized skills and equipment.

For these reasons, public health conducts and encourages a continuing search for simplified techniques which may be applied to the community as a whole or may be employed by the general practitioner in his office. For example, in cancer control we are searching for detection mechanisms that can be applied widely and inexpensively in effective case-finding programs. We are searching for cancerigenic agents in the environment, so that these hazards may be subjected to engineering, chemical, or other controls. In cancer, heart disease, arthritis and rheumatism, and many other serious ailments, we are supporting the unremitting search for therapies that ultimately may be placed in the hands of the general practitioner. Our goal in these present major diseases is not dissimilar to that which we have achieved in venereal disease control—with every private practitioner a "health officer," treating patients in his office; the health department maintaining supporting services of case finding, contact tracing, referral, and treatment of patients unable to pay for private care.

Obviously, we have not reached that point in the development of medical tools for such major problems as cancer and heart disease, comparable with serologic testing and penicillin therapy

in syphilis control. The nation-wide scientific effort in these fields and its accomplishments are another story, and one that is inspiring.

Society has made new demands on science since the war and has given science unprecedented financial support. We are all aware of how little money was available for medical research before the war. In less than a decade, the American people have reversed that condition in their determination to speed up the attainment of their health goals through expanded research. The essential leadership in the promotion of medical research has come direct from the public through their voluntary health organizations and their representatives in Congress.

The American Pattern

The development of the nation-wide effort in medical research thus has followed a characteristically American pattern: society leading, government aiding. Government aid to medical research has grown, but statesmanship from the outset has channeled the greatest part of that growth into the natural habitats of research—our universities, schools of medicine, and hospitals.

Cooperation of voluntary and governmental agencies with the universities and hospitals in medical research is a multimembered partnership. It has engendered mutual respect and greater skills in the solution of common problems. Science and society alike have benefited from this partnership in a vital area of research.

While new techniques for chronic disease control and hygiene of the aging remain in a twilight zone between experiment and universal use, it may be that this experienced partnership can speed the sound application of scientific advances. It may be that we need a "bridge" type of institution, with research, educational, and limited service functions, supported by many community, State, and national organizations.

New Partnerships

Certainly, in facing up to the specific problems of chronic disease and an aging population, it seems clear that public health needs to encourage and to develop many new types of partnership. One that seems of exceptional

value is partnership with university schools of medicine. The foresight of Professor Winslow in keeping postgraduate education in public health at Yale an integral part of the School of Medicine has yielded rich returns. The department's cooperation with the city of New Haven further illustrates the value of this partnership between the university and the community's health services.

Recently the University of Buffalo School of Medicine released the first annual report of its Chronic Disease Research Institute. This project is an interesting experiment in new partnerships. The Public Health Service made available its Buffalo hospital which we were closing and which could be easily converted into the type of facility envisaged by the group of community health statesmen. The New York State Health Department provided a grant-in-aid, and entered into active cooperation with the university. Support for various departments of the institute came from the National Foundation for Infantile Paralysis, the New York State Association for Crippled Children, the New York State Department of Mental Hygiene, the Western New York Heart Association, and the Arthritis and Rheumatism Foundation. The governing board is chaired by the dean of the School of Medicine, and includes representatives from local hospitals, the New York State Department of Health, and the Public Health Service. An able staff has done outstanding trail blazing in its first full year of teamwork.

Let me quote from the report:

"The future plans of the institute are inherent in its purpose: to do research in the field of chronic disease, to discover better and faster means of returning the chronically ill to maximal living within their individual limitations and to teach these newer, better techniques for handling the most complex problems in rehabilitation to medical personnel throughout the Niagara Frontier. The University of Buffalo Chronic Disease Research Institute is a small but complete institution actively serving medical science and education within the community."

Would that there were more such small, complete institutions serving such a purpose within more communities where the problems of the

chronically ill have previously been neglected. Perhaps this modest beginning will give us valuable clues to public health statesmanship in this area. In the meantime, health departments must press on toward society's health goals through the organization of community resources.

Community Health Organization

The ideal of community health organization is nothing less than the mobilization of all the rich and varied forces within an American community in free and friendly association to combat a common enemy and to strive for the common heritage of health and longevity. Inspired by some of our educational institutions, notably the Yale Department of Public Health, the Nation's official and voluntary health agencies have learned a good deal about community organization in the past 15 or 20 years. To their credit, they have put into practice a good deal of this knowledge. The translation of the ideal into practice, however, is difficult as is any activity depending primarily upon interpersonal and intergroup relationships.

In community organization as in program planning and administration, public health officials need especially to be alert in preserving flexibility. If we recall our criteria for statesmanship, we will see why this is so: "Wise statesmen foresee what time is bringing and try to shape institutions and mold men's thoughts and purposes in accordance with the change that is silently coming."

Community organization merely to preserve the status quo of public health can be as stultifying and as far from meeting the needs as can the administration of programs designed for the same purpose. Moreover, community organization of this sort fails to tap fully the creative energies of the community. In particular, the natural leaders outside of professional ranks or in professions not usually associated with public health may possess the humane impulses and the very creativity needed for developing new types of service essential in the solution of our major public health problems.

I know of such a leader who wants to construct a new type of institution for the care of certain types of cancer patients. It will be a modern apartment hotel specially designed and

furnished, constructed beside and with direct connections to a general hospital. The objective here is to provide efficiency apartments where family members or housekeepers may care for the patient in convalescent or other stages of his disease. Physicians would be at hand for routine supervision. When special therapeutic procedures must be carried out, the patient can be removed to the hospital immediately, and without loss of time and the added costs of an ambulance. More costly institutional facilities and services would be released for the care of more acutely ill patients.

This is a challenging idea, and one which may capture the interest of private enterprise, voluntary agencies, and religious organizations. It is an extension of the home care plan which has been developed so effectively by voluntary hospitals and agencies in a few parts of the country. We know that chronic disease and poverty go hand in hand, and that many times the home to which a patient would be returned cannot accommodate the needs of an invalid, no matter how willing the family may be to carry its share of the bedside care. Whether in a hospital-connected apartment hotel or at home, the costs of convalescent or terminal care of the chronically ill will be less than in a hospital. Hospital care for a patient costs three to five times more than care at home.

New and Effective Services

There are many other effective services that a community could provide for the chronically ill and the aging—services which not only relieve suffering and anxiety, but also bring about economies in the operation of public hospital and medical services. Some health departments around the country report housekeeping services, for example; but it is surprising how few communities have explored the possibilities. The New Haven Family Society, as I understand it, was one of the pioneering voluntary agencies to develop such a service.

The District of Columbia Health Department has developed a housekeeping service on a limited scale. Its primary purpose is to assist mothers in the postpartum period or in disabling illness. When these demands on its staff permit, however, the housekeeping service is available to aged persons.

Not long ago, an indomitable lady in her 80's suffered her fourth cerebral hemorrhage. The hospital insurance policy which she had carried for a number of years had been invalidated by previous hospitalization. Even had it been available, she did not want to go to the hospital because, she said, there was no one to look after her "boys"—an older brother and a mentally defective nephew of about 25 years. Here was a family that had never received a penny of public assistance; that owned its home; that managed to get along on the earned pensions of the two old people. The house-keeping service came to the rescue. And at least for 10 critical days when this family most needed help, there was someone to cook nourishing meals, do the laundry, keep the spotless home spotless, help the lady with her personal care, and, incidentally, save taxpayers the costs of hospitalizing her.

I have introduced this "human interest" story, because it exemplifies in many ways the human problems which make up the community problems, the public health problems; and it exemplifies the variety of human resources which must be called upon to help people meet their needs.

World Health

The mobilization of resources to meet human needs is the essence of world statesmanship today. It is in this international arena that public health workers meet face to face the inseparability of their sphere of activity from that of other specialists. Professor Winslow has been a world health statesman since the years of the League of Nations Health Section. He has been telling us all this while that public health does not and cannot function apart from the political, economic, educational, and cultural forces in whatever society it serves. Likewise, industry, commerce, agriculture, education, and government cannot function in isolation from public health.

Several hundred American public health workers are facing these interdependent problems today in their overseas assignments with the Mutual Security Agency and the Technical Cooperation Administration of the United States, and with the World Health Organiza-

tion and other international agencies. Their statesmanship will be measured not alone by their skill in applying modern techniques to the solution of age-old problems in entirely different social and physical settings. Public health statesmanship in the world community also consists in understanding the drive of poverty stricken peoples toward a better life, and in ability to work with representatives of other governments and of such related fields as agriculture, education, industrial production, transportation, and communication.

Public health workers have invaluable knowledge and experience to contribute to the planning and conduct of programs for social and economic improvement in underdeveloped areas. Failure to take into consideration the health and medical aspects of any large-scale economic project may well lead to failure of the total plan. Here again, as in other situations I have mentioned, public health workers, as statesmen, must be alert to the health components in diverse social problems; must challenge disregard of health; and must exercise the arts of interpretation and communication in order that their technical skills may be used constructively.

Conclusion

In this somewhat random discussion, I have left untouched many specific problems in public health which call for statesmanship and many fields in which statesmanship of a high order is being exercised. I shall leave it to you to fill the gaps, for the qualities that make up statesmanship in the boundless field of public health are the same in each sector. Let the measure of our statesmanship now and in the years to come be taken by this yardstick:

"The objective of public health is not merely the prolongation of life but the increase of vigor, efficiency, and happiness of all the members of our complex society. . . It is no easy task that we have set ourselves, no task for those who fear opposition or criticism. Vested interests related either to economic profit or to prestige may stoutly bar the path to achievement. Even

when these are not involved, we are confronted by the stubborn resistances of humanity to those new ideas and new forms of organization against which the average individual desperately defends himself. We must be wise and understanding as well as courageous. The tasks of the future cannot be solved by formulae alone; at point after point on the road there will be struggle in which wounds will be given and taken. Yet the objectives before us are so great that men of heart and courage will not hesitate to meet the risk. . . The road is long but the goal is worth the hazard. We need assume no unnecessary burdens nor needless quarrels. But when we are sure we are right, we must go ahead."

The time? 1936.

The place? The Milbank Memorial Fund Conference on Next Steps in Public Health (4).

The speaker? C.-E. A. Winslow—inspiration of this series of lectures—public health's great statesman.

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International Certificate Requires Official Stamp

Health officers who do not have an official stamp to certify international vaccination certificates are requested to have a stamp made which includes the term "health officer" and the name and address of the health department. This stamp is required to attest to the signature of the immunizing physician, or physicians, affixed on the smallpox and cholera vaccination certificates entered in the new "International Certificates of Vaccination" form soon to be released. This document conforms with the International Sanitary Regulations effective October 1, 1952, and replaces the "International Certificate of Inoculation and Vaccination," PHS-731 (FQ), Rev. 12-48. No certificate is valid without the stamp of a "health officer." Public Health Service officers and medical officers of the Department of Defense will continue to use the seal of their respective service to authenticate these certificates.

Yellow fever vaccination certificates will be issued to the traveler at the time he receives his vaccination at one of the designated yellow fever vaccination centers. This certificate must carry the stamp of the designated clinic.

The Prevention of Rheumatic Fever

RHEUMATIC FEVER is a recurrent disease which can be prevented. It is now generally agreed that both the initial and recurrent attacks of the disease are usually precipitated by infections with beta hemolytic streptococci. Therefore, the prevention of rheumatic fever and rheumatic heart disease depends upon the control of streptococcal illnesses. This may be successfully accomplished by early and adequate treatment of streptococcal infections in all individuals and by prevention of streptococcal infections in rheumatic subjects.

Treatment of Streptococcal Infections

In the general population at least 3 percent of untreated streptococcal infections are followed by rheumatic fever. Among certain individuals, especially those with previous rheumatic fever, the incidence is much higher. Adequate and early penicillin treatment, however, will prevent most attacks of rheumatic fever and eliminate streptococci from the throat.

Diagnosis

In most instances it is possible to recognize streptococcal infections by their clinical manifestations but laboratory tests may assist in establishing the diagnosis.

Epidemiology

The seasonal pattern and presence of similar cases in the community or household may be helpful. For example, streptococcal infections

in the northern United States are most common from January through June. Likewise, a case of scarlet fever in one child would suggest that a sore throat in another has the same etiology.

Symptoms

Sore throat—onset sudden, in the tonsillar area, not in the trachea.

Headache—common.

Fever—variable, but generally from 101° to 104° F.

Abdominal pain—common, especially in children. Not too common in adults, but does occur.

Nausea and vomiting—common, especially in children.

These symptoms are usually *not* present: (1) simple coryza; (2) cough; (3) hoarseness.

Signs

Red throat—frequently beefy red, but if seen early the redness may be mild.

Exudate—usually present.

Glands—swollen, tender tonsillar glands at angle of jaw.

Rash—scarlatiniform (characteristic of scarlet fever, not common).

Discharge—otitis media and sinusitis indicated by (serous or purulent) aural or nasal

This statement was released for publication this month by the Council on Rheumatic Fever and Congenital Heart Disease of the American Heart Association. It was prepared by the council's committee on prevention of rheumatic fever of which Burtis B. Breese, M.D., is chairman and the following are members: Marjorie T. Bellows, Edward E. Fischel, M.D., Ann Kuttner, M.D., Benedict F. Massell, M.D., Charles H. Rammelkamp, Jr., M.D., and Edward R. Schlesinger, M.D.

discharge are frequent complications of streptococcal pharyngitis.

Laboratory

White blood count—generally over 12,000 and in children frequently over 20,000.

Throat culture—positive for hemolytic streptococci.

Therapeutic Response

Almost without exception patients with streptococcal infections are vastly improved within 24 hours after penicillin has been started and the temperature normal, or nearly so. This therapeutic response is characteristic and if it does not occur, the chances are much against the disease being due to hemolytic streptococci.

Treatment

In order to be effective, treatment should be started immediately when a streptococcal infection is suspected and continued for sufficient time to eradicate the streptococci from the throat.

Penicillin is the drug of choice for treating streptococcal infections.

Both the oral and the intramuscular routes of administration have been utilized successfully for penicillin therapy of streptococcal infections. Intramuscular injections have been proved to prevent rheumatic fever. The data on the value of oral penicillin as a preventive are less complete.

Oral administration in comparison to intramuscular administration has these advantages:

1. It is not as distasteful to many patients.
2. It requires fewer physician visits.

It has these disadvantages:

1. Larger amounts of penicillin must be used.
2. It is difficult to administer to vomiting or refractory children.
3. In some adults it gives rise to persistent diarrhea and pruritus ani.
4. It is difficult to be sure that treatment is continued for sufficient time and given in proper relation to meals to be effective.

RECOMMENDED SCHEDULES

Intramuscular Penicillin

Children—one intramuscular injection of 300,000 units of procaine penicillin with aluminum monostearate in oil every third day for three doses.

Adults—one intramuscular injection of 600,000 units procaine penicillin in aluminum monostearate every third day for three doses.

NOTE: Less preferable, but usually effective—two doses as above at 3-day intervals.

Oral Penicillin

First 5 days: 200,000 to 300,000 units $\frac{1}{2}$ to 1 hour before meals and at bedtime (total of 800,000 to 1.2 million units per day in four divided doses. Lesser amounts for children; larger amounts for adults).

Second 5 days: 200,000 to 250,000 units $\frac{1}{2}$ to 1 hour before meals (total 600,000 to 750,000 units per day in three divided doses).

NOTE: To be effective, therapy should be continued for the entire 10 days even though the temperature may return to normal and the patient may feel better within 1 or 2 days.

Combination of Intramuscular and Oral Penicillin

Therapy may begin with one injection of penicillin (300,000 units procaine penicillin with aluminum monostearate in oil) and then, beginning 3 days after the injection, continued for an additional 7 days with oral penicillin according to the schedule outlined above for the second 5 days.

Other Medication

Aureomycin: Less effective than penicillin in controlling streptococcal infection but it is especially useful in those sensitive to penicillin. Dosage: Total 10 mg. per pound of body weight in four divided doses daily for 2 days. Cut dose in half for remaining 8 days of therapy.

New preparations of penicillin: These may be effective and even preferable to the treatment schedules outlined, but at present they have not had sufficient trial to warrant their recommendation.

Other antibiotics: At present there are inadequate data on their value.

Not recommended for treatment

Penicillin troches or lozenges.

Penicillin followed by sulfonamides.
Sulfonamide drugs.

NOTE: Recurrences of streptococcal infection should be treated as primary attacks.

Prevention of Streptococcal Infections

General Rules for Prophylaxis

Who should be treated?

All individuals under the age of 18 who have had rheumatic fever or chorea and all those over this age who have had an attack within 5 years.

When should prophylactic treatment be initiated?

At the end of the second week of the attack of rheumatic fever or any time thereafter when the patient is first seen. Prior to the start of prophylaxis, beta hemolytic streptococci should be eradicated by proper treatment of the patient (see methods of penicillin therapy recommended above).

NOTE: In patients receiving ACTH or cortisone, be cautious that other infections are not masked since the prophylactic dose is inadequate to treat such concurrent illnesses as pneumonia or meningitis.

How long should prophylaxis be continued?

In children, at least to the age of 18; in all those above this age, for at least 5 years from their last attack.

Should prophylaxis be continued during the summer?

Yes.

Prophylactic Methods

Sulfadiazine

This drug has the advantage of being easy to administer, inexpensive, and effective (other newer sulfonamides are probably equally effective). Although resistant streptococci have appeared during mass prophylaxis in the armed forces, this is rare in civilian populations.

Dosage: From 0.5 to 1.0 gm. taken each morn-

ing throughout the year. The smaller dose is to be used in children under 60 pounds.

Toxic reactions: These are infrequent and are usually minor. However, in any patient being given prophylaxis with sulfonamides, consider all rashes and sore throats as possible toxic reactions to the drug, especially if they occur in the first 8 weeks of prophylaxis. The chief toxic reactions are:

1. Skin eruptions: (a) Morbilliform, much like measles—continue drug with caution. (b) Urticarial—best discontinue treatment. (c) Scarlatiniform—often associated with sore throat and fever; unsafe to continue drug.

2. Blood reactions: Leukopenia—Discontinue if white blood count falls below 4,000 and polynuclear neutrophils below 35 percent because of possible agranulocytosis which is often associated with sore throat and a rash. Because of these reactions, weekly white blood counts are advisable for the first 2 months of prophylaxis. (The use of sulfonamides *therapeutically* for any reason in this period should be preceded by a white blood count.) The occurrence of agranulocytosis after 8 weeks of continuous prophylaxis with sulfonamides is extremely rare.

Penicillin

Although experience with oral penicillin for the prophylaxis of rheumatic fever is more limited than that with the sulfonamides, the antibiotic promises to be a safe and effective prophylactic agent. Oral penicillin has the desirable characteristics of being bactericidal for hemolytic streptococci and of rarely producing serious toxic reactions. It has the disadvantages of being more costly than sulfadiazine and, because of the need to give it on an empty

stomach, of being somewhat more difficult to administer.

Oral penicillin represents an alternative drug for rheumatic fever prophylaxis. It is especially important to use this agent for those who do not tolerate sulfadiazine.

Dosage: Although other routines of administration may prove satisfactory, the following schedules are suggested: 200,000 to 250,000 units two times daily is recommended. Since penicillin is best absorbed on an empty stomach, the time of administration should be $\frac{1}{2}$ to 1 hour before a meal or at bedtime. A single dose of 200,000 to 250,000 units before breakfast is less preferable.

Toxic reactions: (1) Urticaria. (2) Reactions similar to serum sickness—they include fever and joint pains and may be mistaken for rheumatic fever. (3) Angioneurotic edema. Although many individuals who have had reactions to penicillin can subsequently take the drug without trouble, it is safer not to use penicillin, if the reaction has been severe and particularly if angioneurotic edema has occurred.

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Epidemiology Course for Nurses

The Public Health Service Communicable Disease Center has announced a course in epidemiology for public health nursing personnel to be given April 27–May 15, 1953, at 441 West Peachtree Street, Atlanta, Ga.; field experience will be available to a limited number, May 18–June 26, 1953, at Jackson, Miss., or Montgomery, Ala. Those eligible to take the course include: communicable disease nursing consultants, public health nursing supervisors, and staff nurses, educational directors, coordinators, and nursing instructors.

The tuition-free course is designed to give the trainee a broader understanding of present-day communicable disease problems and their control, with emphasis upon the principles of epidemiology, the rationale of the collection of laboratory specimens, and the interpretation of laboratory reports; the field experience will give practice in applying these principles.

Applications should be sent by April 1, 1953, to the Chief Nursing Consultant, 50 Seventh Street NE., Atlanta, Ga.

A Community Program for the Prevention Of Rheumatic Fever Recurrence

By MARY ALICE SMITH, M.D.

A PUBLIC HEALTH program to demonstrate techniques of community action in heart disease control began operation in Newton, Mass., in 1948. It was sponsored jointly by the Public Health Service of the Federal Security Agency, the Massachusetts Department of Public Health, and the Newton Health Department. The local medical profession was active in support of the project, and continuing leadership was given by a cardiac program committee composed of six physicians from the staff of the Newton-Wellesley Hospital. The progress of the Newton Heart Demonstration Program, as it was named, has been reported periodically (1-4). This paper is an interim accounting of rheumatic fever activities in the Newton demonstration.

Five general areas of activity were delineated at the beginning of the demonstration program in 1948: physician education, voluntary morbidity reporting, community organization, nutrition services, and rehabilitation. Subcommittees were organized for each of these areas. As experience was gained and the extent of the problem seen more clearly, some plans were modified. Morbidity reporting was abandoned, community organization was turned over to the Newton Community Council, and interest was directed to two or three new fields. One of

these, and a major heart disease problem in Newton, was rheumatic fever.

In 1949, the most recent year for which data are available, rheumatic fever and its sequelae were the leading causes of death from disease in the 10- to 14-year-old age group; in the group between 15 and 24 it was third, being exceeded only by tuberculosis and malignant neoplasms. The amount of chronic disability caused by rheumatic fever is also considerable. Recurrent attacks of rheumatic fever are common, particularly during the first few years following original onset, and each attack damages the heart more severely.

Rheumatic fever attacks are nearly always preceded by hemolytic streptococcal infections. The rheumatic child possesses a peculiar vulnerability and tissue reactivity to certain streptococcal infections (5). Most workers in the field now agree that the beta hemolytic streptococcus, Lancefield type A, precipitates the acute attack of rheumatic fever, even though the mechanism is as yet not fully understood (6). Children in families in which both parents have had rheumatic fever are much more likely to develop the disease than are children of parents with no such history. Due to the influences of the genetic factor and close association, siblings of rheumatic children are especially susceptible (5).

Early treatment of streptococcal infections with penicillin prevents rheumatic fever. In an Air Force study of some 2,300 persons, immediate and thorough treatment of streptococcal infections with penicillin effected a 91-percent reduction in the attack rate of rheumatic fever (7). The daily use of penicillin also has been

Dr. Smith, formerly medical officer-in-charge of the Newton (Mass.) Heart Demonstration Program, Division of Chronic Disease and Tuberculosis, Public Health Service, is now resident physician at Mount Auburn Hospital, Cambridge, Mass.

advocated to protect rheumatic fever patients against recurrent attacks. Other members of their families, too, should be treated when they have streptococcal sore throats. Massell and his colleagues at the House of the Good Samaritan in Boston developed drug schedules in 1948 for the protection of rheumatic fever patients against recurrences (8).

The Newton Program

On the basis of these and other clinical trials, the control of rheumatic fever in Newton seemed possible through application of existing knowledge even though it was incomplete. Previous reports have described in greater detail the following major steps in the development of the rheumatic fever control program in Newton, a Boston suburb with a population of 85,000:

1. At a meeting held in December 1949, the cardiac program committee authorized a telephone survey of physicians to determine the extent of preventive measures then being taken. From this survey, it was learned that virtually no efforts were being made to prevent recurrence of rheumatic fever.

2. As a result of these findings, a rheumatic fever subcommittee was set up to continue the program.

3. Massell's oral penicillin prophylactic schedules (4) were obtained by the subcommittee and introduced at one of the regular teaching sessions sponsored by the subcommittee on physician education.

4. A plan was adopted for penicillin to be dispensed by the health department upon the physician's prescription, at low cost, or free to those unable to pay.

5. So that physicians might acquaint rheumatic fever patients with the preventive care desirable for them, it was planned that the director of public health would write to rheumatic patients listed in his handicapped children's file, requesting them to visit their physicians for advice about prophylaxis.

6. In order to find families with children having a history of rheumatic fever, the cooperation of the public and parochial schools was obtained. A survey form distributed to 14,000 children requested their parents to indicate any

knowledge of rheumatic fever in the family and, for verification of diagnosis, to include the name of the family doctor.

7. It was also decided that a study of the prophylaxis program should be made to evaluate the effectiveness of efforts to place persons susceptible to rheumatic fever under their doctor's care, as well as the effectiveness of the penicillin dosage schedule itself in preventing recurrences of rheumatic fever.

During February and March 1950, these plans were put into effect: The availability of low-cost penicillin was announced; letters were sent to the parents of school children in an attempt to procure additional rheumatic fever histories; and families known to include rheumatic fever patients received letters asking them to visit their physicians for appropriate instruction. As new rheumatic fever families were found, they, too, were directed to their doctors for prophylactic care. During the early months of the program, also, personal visits were made to physicians known to have rheumatic fever patients in their practice. To determine the approximate prevalence of streptococcal infection in the community, free throat cultures of patients with suspected streptococcal infections were made by the Newton-Wellesley Hospital (9).

In the fall of 1950, another announcement was made concerning the availability of low-cost penicillin and use of the prophylactic schedules. As a diagnostic aid, the local physicians then received a copy of a definitive article by Dr. T. Duckett Jones, outlining criteria for the diagnosis of rheumatic fever (10).

The Study Group

In December 1949, just before the program was instituted, only 16 percent of the known rheumatic fever patients were receiving any kind of protection against recurrence of their rheumatic fever. After record searching, physician interviews and analysis of the family history questionnaires, it was believed that, as of January 18, 1952, all patients in need of prophylactic care were known to the health department. On that date there were 74 such patients in the community of whom 55 were known to have had their initial attack since the

beginning of 1945 (table 1). All of these 74 persons had been offered and were then receiving some type of prophylactic care. In terms of the type of preventive measures advised, there were three groups of patients.

The schedule (4) recommended to 52 persons consisted of continuous daily prophylactic therapy for 5 years after the date of their last attack. Forty-four of these persons had had initial attacks since the beginning of 1945. There were 15 patients whose physicians were relying on the immediate treatment of streptococcal infections to protect them against rheumatic fever recurrence, only 5 of whom were known to have had their first attack since 1945. The seven patients receiving sulfonamides had been taking them before the program began—all but one of these were under the care of physicians practicing outside Newton (table 1).

All but 1 of the 74 patients were between 5 and 21 years of age. Most of those who were known to have had signs or symptoms of carditis were in the "regular" penicillin clas-

Table 1. Rheumatic fever patients in prophylaxis study, Newton, Mass., by type of therapy and time of first attack, as of January 18, 1952

Time of first attack	Total	Number receiving penicillin		Number receiving immediate treatment for streptococcal infection	Number receiving sulfonamides
		Regularly ¹	Irregularly ²		
Total	74	28	24	15	7
Prior to:					
1945	7	2	1	3	1
1945	7	3	1	1	2
1946	8	4	1	2	1
1947	10	6	2	0	2
1948	6	1	4	1	0
1949	10	2	8	0	0
1950	10	6	2	1	1
1951	4	3	1	0	0
Not known	12	1	4	³ 7	0

¹ Returned within given time limits for refill.

² Failed to return within given time limits for refill

³ 1 over 21 years of age.

Table 2. Payment status of rheumatic fever patients receiving penicillin prophylaxis, as of January 18, 1952

Type of prophylaxis	Number of patients		
	Total	Paying	Non-paying
Total	67	36	31
Penicillin regularly	28	13	15
Penicillin irregularly	24	10	14
Immediate treatment for streptococcal infections ..	15	13	2

sification. Involved in the care of these rheumatic fever patients were 37 physicians, 26 practicing in Newton and 11 outside the city, and 3 clinics, of which 2 were attached to the local hospital.

The patients who received penicillin are grouped in table 2 according to their payment status. Since the price of penicillin for 1 year was only about \$60 per patient under the low-cost plan, many parents were able to pay this sum to prevent recurrences of the illness. However, when families could not afford the low-cost penicillin, their physicians could recommend that it be furnished without charge.

"Regular" vs. "Irregular"

More than half of the 52 persons who were taking penicillin received it regularly, returning to the health department about once a month for 33 days' supply. There were 24, however, who were somewhat irregular in following the regimen and did not obtain sufficient penicillin to take the prescribed dosages. Some effort was made to discover why these 24 were irregular in obtaining penicillin refills. Since there were about equal numbers in the groups paying and not paying within the classes getting "regular" and "irregular" penicillin refills, it is likely that some factors other than cost influenced the "irregular" group to neglect to obtain their monthly supplies. Of the 28 patients returning regularly, 17 were given prophylaxis within the first 3 months

of 1950, coincident with the major education effort. The remaining 11 were added to the series at a rate of about 1 each month thereafter.

Interviews with the physicians brought out the fact that, in more than half the instances where patients were replenishing supplies only irregularly, the physicians had been unaware of the irregularities until these were brought to their attention. The same physicians were asked for their reaction to the suggestion that the health department should send out reminder cards to patients when their supply should have been consumed. Only about half the opinions favored this measure, and the suggestion was not pursued.

Some physicians were able to keep all their patients in the "regular" penicillin category throughout the period of this study. Others were unsuccessful in teaching all of their patients the advantages of the regular use of penicillin.

Three physicians had patients in all three of the treatment categories—prophylactic penicillin, sulfonamides, immediate treatment for streptococcal infections.

Of the 28 patients in the "regular" penicillin group, their physicians reported that only one had had a streptococcal infection while receiving penicillin—a patient with scarlet fever in whom repeated throat cultures revealed no beta hemolytic streptococci. At least 11 other non-streptococcal infections, however, did occur within this same group. No penicillin reactions were reported by physicians.

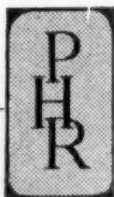
There were no recurrences of rheumatic fever among the 74 patients through January 18, 1952.

The program will be continued by a routine procedure in which, on finding children with rheumatic fever (as, for example, through a school physical examination), the health de-

partment will send the child's physician an announcement of the availability of penicillin and a request that he return a card noting prophylactic measures being taken and permissible physical education activities at school.

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Employment of the Older Worker

By THEODORE G. KLUMPP, M.D.

THE PRACTICE of compulsory retirement on pension at a fixed chronological age is a fairly new practice. Its adoption started with the incredibly swift industrialization of the 1900's and the growth of large business units.

The acceptance of pension retirement plans by industry was hailed on all sides as a great advance. Previously, older workers had simply been discharged without provision for their future welfare. The conventional idea had prevailed that workers should save for their old age or become dependent on adult offspring or on charity. Industry's voluntary acknowledgment of a concern for the welfare of its workers beyond their years of service was indeed a step forward.

Now, industry has accustomed itself to the practice of compulsory pensioned retirement at a fixed calendar age. The practice is simple in administration, and, during slack periods especially, it provides an easy, automatic way of casting off a number of surplus workers who are generally on top of the pay scale. In addition, compulsory retirement opens doors for advancement, a custom which business will not easily yield.

Human Side of Compulsory Retirement

There is growing recognition, however, that the mere provision of bread and shelter for older persons is not enough. No longer are they regarded as a statistical group—a series of figures on a sheet of paper—but they are regarded as individuals whose happiness is of increasing concern.

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"Employment, . . . 'nature's physician,' is so essential to human happiness that indolence is justly considered the mother of misery," wrote Robert Burton over three centuries ago (1).

Youth can be content with opiate dreams of future achievements. But those approaching 50 or 60 can no longer derive solace from dreams of the future. Age plays for real stakes. It wants something to do, and that something must be real. Useful work is the most real thing we have to sustain us in this life of ours.

Compulsory retirement at a fixed calendar age treats all workers alike. But all workers are not alike. Some have the intellectual resources to occupy themselves without an occupation. Most people, however, are not happy when they are idle. In the words of the physiologist, Dr. A. J. Carlson, "The physiologic age of the worker is not synonymous with his chronologic age, owing to the individual variables in heredity, mode of living, accidents, and sequelae of diseases" (2).

What is popularly called old age is in truth only that period of life during which the rate of decline of cells, tissues, or organs has progressed to the point where the decline is visible to the naked eye. The decline begins at conception, and it is not the same for all human beings nor is it equivalent for all organs and functions of the body. This is well illustrated by the life of Christen Jacobsen Dragenberg, the Dane who died in 1772 at the age of 146. At 13, he went to sea. He took part in the service of three kings warring against Sweden and served many nations in merchant navies. When nearly 70, he was taken prisoner by Algerian pirates and sold as a slave. After 15 years, he escaped and again went to war against Sweden. At 111, he married a 60-year-old woman.

He outlived her and, when he was 130, proposed to several women. He was rejected but mastered his disappointment and lived on for 16 years (3).

Our society has been quite illogical and inconsistent in its attitude toward the older worker.

On the one hand, we have not objected to electing or appointing older persons to positions of greatest responsibility. In the 81st Congress (1st and 2d Sessions, 1949-50), 34 percent of the Senators were over 60, as were almost 19 percent of the Representatives. In a study made in 1946 I found that over 44 percent of 500 top business executives who were listed consecutively in the 1946 edition of "Poor's Register" were over 60. Bernard Baruch, 82 years of age; Arturo Toscanini, 85; Herbert Hoover, 78; General George Marshall, 71; and Ambassador Walter Gifford, 67, have not found their age an obstacle in the path of progress.

On the other hand, we maintain blind and unselective compulsory retirement rules for the rank and file of workers. Such rules automatically eliminate those who have reached the same age regardless of their fitness, ability, and contribution to the group.

Economic Side of Compulsory Retirement

From an economic point of view, it would be sound policy to permit older people to work as long as they are productive and desire to work. Since a country's national wealth, purchasing power, and standard of living rest squarely on productivity, our economic stream flows best when we have the largest number of active producer-consumers. The unemployed contribute nothing to the economy.

In about 30 years, the United States will have more individuals over 45 years of age than the 61 million (4) gainfully employed today. It is conservatively estimated that by 1980 there will be between 160 and 180 million people; 66 million of them will be 45 and over; 24 million will be 65 and over.

If in 1980, for example, we were to employ only one-fifth of the estimated 24 million people over 65, at an average annual salary of \$2,500, they would earn for themselves 12 billion dollars each year. This load of support would be

taken largely off the shoulders of young workers. The more emeritus workers, the greater the burdens will be on those active workers who must support them, either by direct contribution or by taxes, along with their own families.

The argument has been made that older workers should be cleared out to make way for younger ones. This is only another way of saying that there are more workers than jobs. During World War II, no one was afraid that the old or the physically handicapped were taking jobs from younger, more able people. There is no arbitrary age at which the older worker begins to repress the younger. Every older individual high on the ladder of advancement holds a job a younger person feels he can fill. This will be just as true in 1980, when we may be forced to retire people at 45 or 50, if we have failed to find a more logical way of reducing the disparity between jobs and workers.

From another point of view—we are witnessing today a great ground swell of public sentiment in favor of State or Federal old age pensions for those over 65. The figure of \$100 a month is one prominently mentioned objective. By 1980, this could cost the country \$28,800,000,000. When this sum is added to other welfare benefits which have been adopted, or probably will be, we are confronted with an astronomical figure which some statesmen declare we cannot afford.

Why Selective Retirement?

In view of these facts, it is increasingly clear we must overcome the prejudices of present-day employers against hiring older workers and retention of the fit. The fixed formula of retirement must be made more flexible and must be broken down into alternative possibilities:

Continued work for the fully productive.

Job reassignments for those capable of performing other duties.

Down-grading and "tapering off" when necessary or desirable.

A whole new system of fitness testing, job analysis, and selective placement awaits development.

To encourage the cooperation of industry, some economists have suggested a pension tax rebate so that employers will keep workers be-

yond the compulsory retirement age. Henry W. Steinhaus, in a study for the National Industrial Conference Board, considers that an employers' tax incentive is feasible, and, in addition, he proposes an increase in pension benefits for employees for each year their retirement is deferred beyond age 65 (5).

We choose and we select when we hire. Can't we do the same when we retire our workers?

We should devise methods of determining which people are capable at 65 or 70 and which people are not. A man isn't fit one day and unfit the next because a page of the calendar has turned. By the same token, he isn't conservative one day and liberal the next, or cautious one day and reckless the next.

The Armed Forces have successfully handled the problem of selective retirement by retirement board procedures which determine the physical and mental fitness of servicemen and officers in the light of the current needs of the services. Perhaps industry could find in these procedures a sound basic pattern which can be adapted to its own purpose. An infinitesimally small number of industrial organizations have practiced selective retirement with success.

In any circumstances, a social rule which eliminates the fit with the unfit, which destroys the good with the bad, or which punishes the innocent with the wicked is not a good rule. Social progress may be measured, in the last analysis, by the degree of skill and discrimination with which society solves the individual problems of its members.

Bernard Baruch is quoted in the *Washington Daily News* of December 29, 1949, as saying:

"How hideous a mockery it would be if, as a result of advances in medicine, surgery, hygiene, and higher living standards, older people were left willing and able to work but Society deprived them of something to do."

Fortunately, the idea that compulsory retirement on a calendar age basis is wrong is gaining general acceptance. The National Health Assembly on May 4, 1948, unanimously adopted a recommendation to this effect (6).

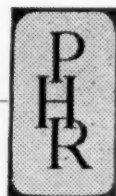
In his 1948 report to the President on the Nation's health, the Federal Security Administrator states:

"Efforts should be directed toward accomplishing selective retirement based on individual capacity rather than age . . . Both public and private employers would profit equally with employees from working out techniques for gradually relieving individuals of more taxing responsibilities as they develop the limitations of advancing age, by keeping pay commensurate with productivity and by full use of the possibilities of vocational retraining" (7).

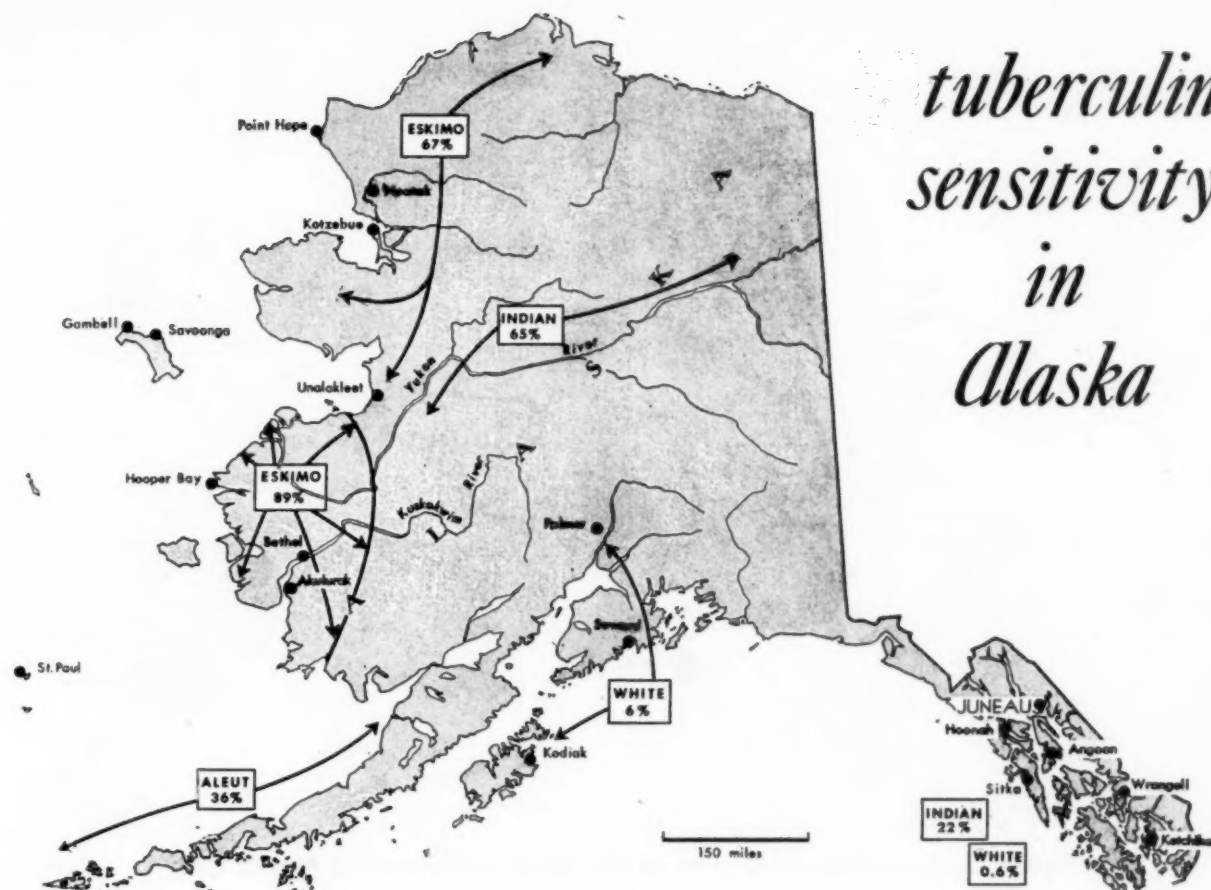
But ideas are sterile unless we act on them.

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tuberculin sensitivity in Alaska



Towns and villages shown are those where 100 or more tests are counted.
Percentages are reactor rates among 5- and 8-year-old children.

By EDWARD S. WEISS, M.P.H.

ALTHOUGH it is generally recognized that tuberculosis constitutes one of the most serious health problems in Alaska, few specific data are available for measuring its extent. The commissioner of health for Alaska has quoted a 1950 tuberculosis death rate among the Eskimos, Indians, and Aleuts of 600 per 100,000 population and a prevalence of active tuberculosis of 25 percent in some villages (1). In comparison, the estimated tuberculosis death

rate in the continental United States in 1950 was about 23 per 100,000 population (2).

Prerequisite to a reasonable interpretation of these figures for Alaska, however, is some knowledge of the number and distribution of the people. The 1950 civilian population, based on Bureau of the Census figures (3) was about 108,000: Eskimos, Indians, and Aleuts numbered 34,000; other civilians, mostly whites, 74,000. The white population is concentrated in a few comparatively large cities, but the Eskimo, Indian, and Aleut population is scattered throughout the Territory in many small villages (figs. 1 and 2). Evaluation of the magnitude of the tuberculosis problem

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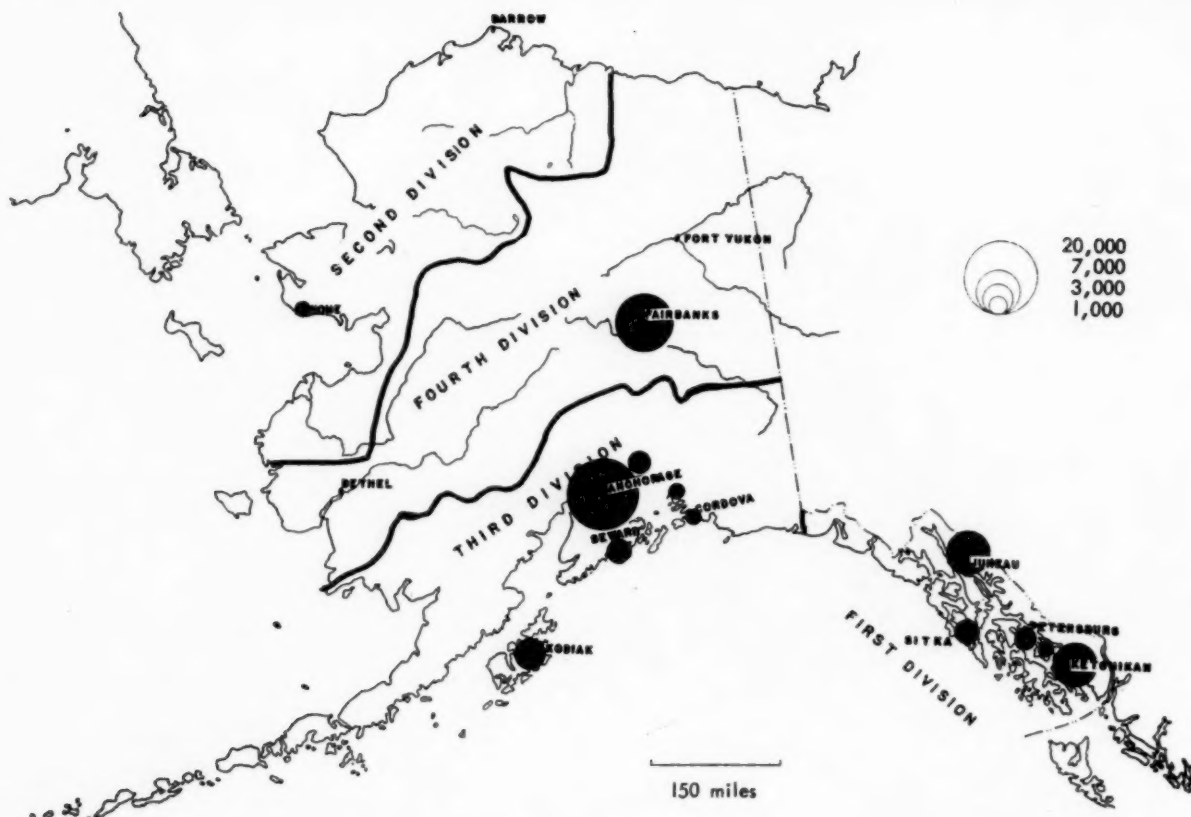


Figure 1. Estimated distribution of the white population of Alaska, 1950.

therefore presents difficulties not usually encountered in public health practice in the States.

The 90-percent increase in the white civilian population of Alaska between 1939 and 1950 was largely due to the entry of employable adults and their children into the Anchorage and Fairbanks areas. Since many of these newer residents, as well as some of the older ones, return to the States for medical care, especially when extended hospitalization is involved, tuberculosis mortality statistics are of little value with respect to this group.

Rejecting mortality statistics as an index of prevalence leaves two practical measures: mass X-ray survey results and tuberculin sensitivity data. Although records of both are available, the latter provide greater coverage numerically and geographically. They are a byproduct of an extensive BCG program of the Alaska Department of Health. Since age-specific tuberculin sensitivity rates are among the most useful measures of the prevalence of infection, the results of tuberculin tests have been tabulated

and analyzed for specific racial groups in designated geographical areas in order to achieve a preliminary definition of the tuberculosis problem.

Materials and Methods

In September 1948, the Alaska Department of Health began its BCG program. By the spring of 1951, when the program was interrupted for administrative reasons, about 30,000 tuberculin tests had been performed on civilian persons of all ages throughout the Territory.

In general, groups which were predominantly Eskimo, Indian, or Aleut were tested with a dose of 0.00002 mg. (1 tuberculin unit) of PPD-S; those which were predominantly white, with 0.0002 mg. (10 tuberculin units) of the same product. However, the Aleuts whose records were selected for this study received a dose of 0.0002 mg. of the tuberculin.

Results of the tests were recorded only as negative or positive. The reaction was classi-

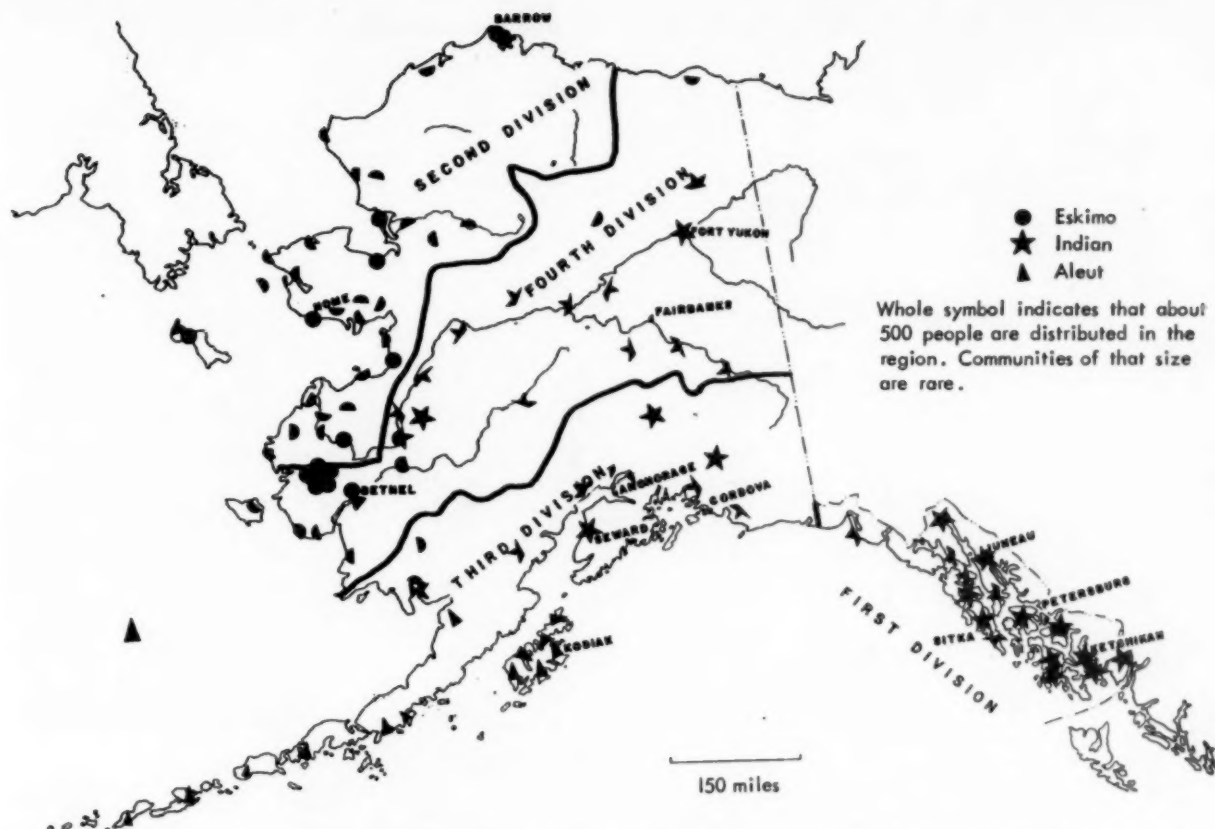


Figure 2. Estimated distribution of Eskimo, Indian, and Aleut population of Alaska, 1950.

fied positive if the area of induration measured 8 mm. or more in diameter 48 hours after injection of the tuberculin.

The records of 6,504 children through age 14 years who were tested on the first visit of the BCG team to their respective communities were selected for tabulation and analysis. The age limit of 14 years was set when preliminary examination of the data disclosed that almost all native adults and older children were reactors. Over half of the original group of records was eliminated on this basis. The availability of two sets of data based on different tuberculin doses and the existence of less than 20 records for small isolated communities were other reasons for eliminating records.

Although combination of tests with different doses was avoided, no further distinction was made between the results of tests with the 0.0002 mg. and the 0.00002 mg. doses. Furcolow and his colleagues (4) showed that although there was a marked increase in the number of reactors among tuberculous children as the PPD dose

was increased from 0.000001 mg. (0.05 tuberculin unit) to 0.00001 mg. (0.5 tuberculin unit), the latter dose brought the S-shaped dose-response curve so near its upper asymptote that the next increase to 0.0001 mg. (5 tuberculin units) elicited few additional reactors. They further showed that the greatest increments in reactors among apparently nontuberculous children were in the tenfold steps above 0.0001 mg.

The difference in the two doses used in the Alaskan program, therefore, cannot account for more than a negligible portion of the differences in sensitivity rates.

Results

The age-specific tuberculin sensitivity rates for each of seven groups, homogeneous with respect to race, area, dose, and pattern of response, and the observations from which they were computed are presented in the table.

A number of alternative ways of summarizing these data for comparative purposes are

Tuberculin sensitivity, by age, race, and area, Alaska, 1948-51

Age (in years)	Eskimo		Indian		Aleut	White	
	Yukon and Kuskokwim Deltas	Northwest coast and Seward Peninsula	Interior	Southeast (panhandle)	Aleutian Islands to Kodiak	South central	Southeast (panhandle)
Percent positive							
Under 1.....	12.8	4.1	19.0	4.9	2.5	0	0
1 to 2.....	41.8	19.1	25.0	9.6	11.1	.8	0
3 to 4.....	76.6	40.6	30.2	13.7	25.0	0	.8
5 to 6.....	86.9	62.0	52.0	23.4	25.4	4.5	.6
7 to 8.....	91.0	72.6	79.2	21.4	45.1	7.0	.5
9 to 10.....	88.9	80.1	81.8	49.6	52.6	8.2	2.0
11 to 12.....	95.5	83.0	81.2	46.0	60.0	6.1	6.4
13 to 14.....	94.7	88.1	92.9	52.1	83.9	13.9	10.5
Number tested							
All ages.....	1,262	1,500	201	702	582	1,274	983
Under 1.....	109	147	21	41	40	80	26
1 to 2.....	196	237	36	83	81	132	84
3 to 4.....	184	229	43	80	84	165	132
5 to 6.....	183	216	25	111	71	178	169
7 to 8.....	177	164	24	112	91	214	194
9 to 10.....	152	176	22	117	78	184	148
11 to 12.....	110	171	16	87	75	163	125
13 to 14.....	151	160	14	71	62	158	105

available. For example, the annual infection rate required to establish the observed levels of sensitivity or the age at which 50 percent of the children had attained sensitivity to the antigen might be used. In preference to these more elegant parameters, a simple expression of the proportion of reactors in the middle age groups, 5 through 8 years old, was selected.

The proportions of reactors among children 5 to 8 years old in each of the seven groups, designated by race and area, are shown on the map on the title page. They range from an almost unbelievable high of 89 percent for Eskimos in the region of the Yukon and Kuskokwim Deltas to 0.6 percent for white children in the southeastern panhandle.

The Eskimo children of the northwest apparently are less exposed to infection than their southern kinsmen, for the sensitivity rate there is 67 percent, about the same as that found among the Indians of the interior (65 percent). Southeastern Indians appear to be in a compar-

atively favorable condition, with 22 percent of their 5- to 8-year-old children reacting to tuberculin.

The comparable rate among Aleuts is 36 percent, very high in comparison to the 6 percent and 0.6 percent observed among white children in the two designated areas but much lower than that for either group of Eskimos or the Indians of the interior.

Discussion

The variations in sensitivity among the seven specified Alaskan groups almost cover the range recorded for the rest of the world. No available report, not even that based on tests of "Chinese children of the poorest classes" (5), shows levels of sensitivity exceeding those observed among the delta Eskimos. On the other hand, few communities in the United States show levels lower than those recorded for the white children of the panhandle. Myers, for example,

states that there are now many schools in Minnesota in which no child reacts to tuberculin (6). That goal is within the grasp of one group of Alaskans, but at present completely out of the reach of many others.

The success of any control program attempting to deal with tuberculosis in Alaska or even with tuberculosis among the Eskimo, Indian, and Aleut population in Alaska will require an appropriate "area control" viewpoint. Different plans, procedures, and objectives may have to be used for various areas.

Summary and Conclusion

1. The records of tuberculin tests on 2,762 Eskimos, 903 Indians, 582 Aleuts, and 2,257 white children through age 14 years were selected from records of the Alaska BCG program.

2. The records were tabulated to show the age-specific sensitivity rates prevailing in selected population groups.

3. The rates observed for Eskimo, Indian, and Aleut children 5 to 8 years old ranged from 89 percent among a large group of Eskimos to 22 percent among Indians of the southeastern panhandle. The rate for another group of Eskimos and the Indians of the interior was approximately 65 percent.

4. Sensitivity rates of 0.6 and 6.0 (similar to those observed in cities of the United States)

were found among white children aged 5 to 8 years old.

Although conventional control measures are probably adequate for maintaining or reducing the low prevalence of tuberculosis among the white residents of the Territory and the Indians of the southeastern area, it is unlikely that they can succeed among the other groups in Alaska.

* * *

A list of the villages selected for this report, number and date of tests in each, and the dosage of tuberculin used may be obtained from the author.

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Indexes for 1952

The index to *Public Health Reports* for 1952 (vol. 67) will be published as a separate and distributed to all subscribers with an early issue. In addition to author and subject entries for all material which appeared in the monthly issues, the index will contain data for *Public Health Monographs* as well as a cumulative listing of monograph titles published through December 1952.

Complement Fixation Tests For Murine Typhus On Small Mammals

By RUTH KEATON, B.S.

BILLIE JO NASH, B.A.

J. N. MURPHY, JR., M.A., M.S.P.H.

J. V. IRONS, Sc.D.

THE IMPORTANCE of commensal rats and their fleas in the epidemiology of endemic typhus was well established in 1931 (1,2). Following Dyer's report (3) on the experimental infection of the woodchuck, meadow mouse, and whitefooted mouse with endemic typhus, Brigham (4,5) indicated that many species of rodents and other mammals were apparently susceptible to endemic typhus. Sparrow (6) recovered a strain of endemic typhus rickettsiae in the house mouse (*Mus musculus*), as did Brigham (7) with his experiments on a field mouse (*Peromyscus* sp.).

In view of the wide distribution of endemic typhus in commensal rats in Lavaca County reported by Irons and associates (8), inquiry into the possible occurrence of infection in other small mammals seemed worth while. Morlan and co-workers (9) used the complement fixation test as an indication of natural infection, but Rickard and Worth (10) considered the findings on the wild-caught cotton rat (*Sigmodon hispidus*) to be nonspecific.

Methods

Live animals were captured in 1945 and 1946 near Hallettsville, in southeast Texas. Generally, the ectoparasites were identified while alive. The ectoparasites to be tested for typhus were appropriately pooled and stored on dry

Miss Keaton and Miss Nash are bacteriologists; Mr. Murphy is associate director, and Dr. Irons is director of the bureau of laboratories, Texas State Department of Health.

ice under glass seal. The animals' brains were removed for tissue infectivity tests and were also stored on dry ice. Tests of the tissues of serologically reactive animals and pools of their fleas aided in evaluating the significance of low titers.

Blood samples were obtained by cardiac puncture soon after capture of the animals. Serums were separated aseptically and were kept at ice-box temperature until examination. Serums were inactivated 30 minutes immediately before testing at 56° C. Each serum was subjected to a quantitative complement fixation test employing endemic typhus rickettsiae. A slight modification of the procedure described by Brigham and Bengtson (11) was used. The result was recorded as reactive when a 3+ or greater reaction was obtained with satisfactory controls at a 1:20 or greater dilution of serum.

When a serum was reactive, the corresponding brain suspension was emulsified and inoculated individually into hamsters for evidence of typhus. With negative serologic findings, the brains of animals of the same species, particularly from the same trapping area, were similarly tested in pools of varying number. Pools of fleas from the same host species taken in the same area were similarly tested. Each hamster was bled twice, both before inoculation and 3 or 4 weeks later, and the serums were run in the quantitative complement fixation test. With positive findings, titers tended to be high on the second bleeding. This was the procedure recommended by Plotz, Wertman, and Bennett (12) for identifying rickettsial agents isolated in guinea pigs or mice. The utilization of specific complement fixation tests is much more economical than cross immunity and other tests in the guinea pig for identifying endemic typhus rickettsiae. A summary of findings is shown in the table.

The brain tissues of 3 of 17 house mice (*Mus musculus*) taken from 3 of 44 places surveyed yielded typhus rickettsiae. Most of the house mice were trapped on premises in close association with commensal rats. Curiously enough, those trapped in the fields were uniformly negative. Native rats and mice were found strictly in the fields. Tests of the brain tissues from the cotton rat (*Sigmodon hispidus*), the pack rat

Results of complement fixation tests for typhus fever on animal serums

Mammal species	Total number tested	Percentage reactive	Titer percentage		
			1:20	1:40	Above 1:40
<i>Didelphis virginiana</i> (opossum)-----	27	6.9	6.9		
<i>Neotoma floridana</i> (pack rat)-----	14	14.2	7.1	7.1	
<i>Baiomys taylori</i> (field mouse)-----	101	0			
<i>Sigmodon hispidus</i> (cotton rat)-----	62	8.0	8.0		
<i>Spilogale indianola</i> (civet cat)-----	2	0			
<i>Mus musculus</i> (house mouse)-----	216	7.8	.9	4.6	2.3
<i>Perognathus hispidus</i> (pocket mouse)-----	3	0			
<i>Peromyscus leucopus</i> (white-footed mouse)-----	5	0			
<i>Geomys breviceps</i> (gopher)-----	28	0			
<i>Procyon lotor</i> (raccoon)-----	13	0			
<i>Reithrodontomys fulvescens</i> (harvest mouse)-----	9	0			

(*Neotoma floridana*), and the opossum (*Didelphis virginiana*) were uniformly negative.

A pool of 20 fleas (*Ctenocephalides felis*), collected from two opossums at Hallettsville in the summer of 1946 and not previously reported, gave an unequivocal positive test for typhus. These opossums were trapped in an oil mill which had not been dusted with DDT. The opossums showed negative complement fixation tests. Eight pools of fleas collected from negative rats and mice and tested for harborage of typhus rickettsiae gave negative results.

Discussion

Although occasional serums from cotton rats, wood rats, and from an opossum were reactive in the complement fixation test for endemic typhus, the titers were relatively low. However, similar findings on commensal rats probably would have been considered as evidence of infection or immunity to typhus. Low titers and failure to demonstrate the infectivity of brain tissues of cotton rats, pack rats, or opossums cast doubt on the specificity of serologic findings on these animals. The percentage of house mice showing positive serologic findings was also relatively low, but the titers were not invariably low, and endemic typhus rickettsiae were obtained from the brains of three house mice. The relatively few places harboring house mice with evidence of past infection contrasted sharply with findings for the domestic rat (8).

The finding of typhus rickettsiae in a pool of fleas collected from the two opossums, and in

other pools of fleas collected from nonmurine hosts (13, 14) was perhaps fortuitous, as it is possible that the fleas had acquired the infection from rats. At any rate, these findings do not in any way detract from the primary role of commensal rats in the epidemiology of endemic typhus fever.

Summary

Endemic typhus rickettsiae were recovered from brains of three house mice taken from human habitations and from a pool of 20 fleas collected from two opossums.

House mice trapped in fields were uniformly negative.

Unequivocal evidence of typhus in small mammals other than commensal rats and mice was not obtained.

Serologic findings on the pack rat, cotton rat, and opossum were of doubtful significance.

ACKNOWLEDGMENT

The Lederle Laboratories, Pearl River, N. Y., supplied the endemic typhus antigen used in the study.

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Public Health Service Staff Announcements

A new post has been created in the Bureau of State Services of the Public Health Service to give over-all direction to field research. **Dr. Justin M. Andrews** will fill the post as an Assistant Surgeon General and Associate Chief of the Bureau. He will direct the programs of applied research in the control programs and at the same time will work with the States in their programs requiring research. The major Public Health Service units involved are the Communicable Disease Center at Atlanta, the Environmental Health Center at Cincinnati, and the Arctic Health Research Center at Anchorage.

Since January 1951, Dr. Andrews has been chief of the Communicable Disease Center, and was deputy chief for 6 years previously. He is a nationally known authority on malaria and other insect borne disease. His experience includes 12 years of university teaching, the direction of Georgia's malaria and hookworm service, and wartime service in Europe and the Pacific. He is a member of the Board of Editors of *Public Health Reports*. Dr. Andrews, a senior scientist, was commissioned in the Public Health Service in 1946.

Dr. Theodore J. Bauer succeeds Dr. Andrews as Chief of the Communicable Disease Center. Dr. Bauer has been chief of the Division of Venereal Disease since

May 1948. Before that he was for 5 years the venereal disease control officer of the Chicago Board of Health and medical officer in charge of the Chicago Intensive Treatment Center for venereal disease. Dr. Bauer, a commissioned medical officer, has served in the Public Health Service since December 1934.

Miss Bertha Tiber, Public Health Service commissioned nurse, has been assigned to Tripoli to work with Libyan nurses and other health aides to extend public health nursing services, especially in rural areas. Her assignment is part of the United States technical assistance program. Miss Tiber recently served as chief nurse in the American Zone of Germany and, in 1945, as chief nurse of the Middle East Office at Cairo of the United Nations Relief and Rehabilitation Administration.

Dr. Oswald F. Hedley, 49, chief of the public health office of the Mutual Security Agency, died November 18, 1952. His Public Health Service career began as an intern in 1918 and included research in rheumatic heart disease as well as numerous field assignments here and abroad. In 1947-48 he was medical director of the American Mission for Aid to Greece. Until his association with the Mutual Security Agency in 1950 he served as liaison officer for the Economic Cooperation Administration.

Provisions of State Laws Governing Local Health Departments

By CLIFFORD H. GREVE, M.S.P.H.

FOR SOME TIME the need for a study of the provisions of State laws applicable to the establishment and operation of local health departments has been apparent from the requests which the Public Health Service has received for information or assistance on this subject. The primary purpose of this study was to secure information that would be useful to States planning legislative programs aimed toward organization and development of local health departments.

Since there are marked variations in patterns of local governments, no model legislation has been developed. However, some type of advisory group composed of representatives of State and local governments as well as the Public Health Service may be established in the near future to develop recommended alternative provisions that may be incorporated into State statutes or regulations.

The field work on the study was accomplished by the regional office personnel of the Public Health Service with the assistance of the regional attorneys. A questionnaire was completed for each State on the basis of an analysis of the State's statutes and regulations. Information on procedures governed by commonly

accepted practices was supplied by interviews with State health officers or their representatives. In addition, State health officers were requested to state their opinions of desirable provisions that should be included in statutes.

This preliminary report is confined to a factual analysis of existing laws, regulations, and commonly accepted practices with respect to boards of health, health officers, and the organization of local health departments. Reports relating to financing and staffing of health departments and powers of health officers, boards of health, and health departments are in preparation.

General Comments

In many States the legislation with respect to local health departments has dealt primarily with boards of health and health officers. Frequently, legislation permitting the organization of health departments as agencies of local government was added in piecemeal fashion. Although conflicting laws were generally repealed, failure to do so in some States has led to marked confusion as to the legal status of health department activities.

The study also reveals that in the absence of statutes dealing with some of the more important aspects of local health department organization, State health departments have been reluctant to prescribe regulations directed to these specific problems.

From the data collected, it is apparent that there are large volumes of statutes applicable only to cities and that these provisions in a

Mr. Greve is chief of the analysis and reports section of the Division of State Grants, Bureau of State Services, Public Health Service. He was associated with Joseph W. Mountin, M.D., in the development of "Public Health Areas and Hospital Facilities—A Plan for Coordination."

given State may vary markedly from the provisions applicable to counties and districts. It is also apparent that certain types of local governmental units are frequently exempt from general statutory provisions, but are covered by special statutes not generally applicable to all local governmental units.

The existence of specific statutes dealing with various classes of local governmental areas does much to complicate the establishment of local health departments. For example, in one State there are six classes of local governmental areas which may form a local health department, provision being made for each class under a different set of statutes. New legislation introduced under these circumstances frequently only adds another procedure by which local health departments may be formed, rather than clarifying and simplifying the several existing provisions for the formation of local health departments.

Local Boards of Health

Local boards of health are mandatory by statute in at least some type of local governmental area in 41 States. Six other States have permissive provisions for boards of health applicable to some local governmental areas. There is only one State in which no statutory provision, either mandatory or permissive, is made for boards of health. Regulations for the establishment of local boards of health exist in only two States, and in both of these States statutory requirements also are present. Although provided for by law, local boards of health do not actually function in some States.

Table 1 indicates that in 24 States, boards of health are provided for by mandatory statutes generally applicable only to local areas. Three States have mandatory provisions applicable only to cities. Four States have permissive authority which is generally applicable to local areas, and 2 States have such provisions applicable only to cities. There are 14 States in which it is mandatory for some governmental areas to have boards of health while it is permissive for other areas to have them. There are 3 States in which current statutes require local areas to have boards of health, but legislation recently enacted makes it permissive for

Table 1. Number of States having mandatory or permissive statutes for establishing local boards of health, by type of statutory provision¹

Type of statutory provision	Number of States ²
Mandatory provisions only.....	27
Mandatory statute generally applicable to local areas.....	24 (5)
Mandatory statute applicable only to cities.....	3 (3)
Mandatory and permissive provisions.....	14
Mandatory in some local areas but permissive in others.....	11 (8)
Mandatory under current law but permissive in units established under new legislation.....	3 (1)
Permissive provisions only.....	6
Permissive statutes generally applicable to local areas.....	4
Permissive statutes applicable only to cities.....	2 (2)
No mandatory or permissive provisions.....	1

¹ Since the basic governmental unit in New England is the town, the data for these States have been included in the same category as county data for the other States.

² Figures in parentheses indicate the number of States included in the tabulation in which the provision is applicable only to certain local governmental areas or only under certain conditions.

newly created health departments to have such boards.

State health officers, when asked to comment on the advisability of local boards of health, almost unanimously expressed the opinion that such a body should exist, but expressions as to its function varied widely. Three State health officers questioned the desirability of a local board, 7 felt it should function as an advisory body only, while 33 felt that it should serve as a policy-making body through the adoption of rules and regulations.

District Boards of Health

Districts may be defined as a health jurisdiction which encompasses more than a single local governmental area. Such districts may be city-county, multicounty, multicity, or any other combination of local governmental areas. Thirty-six States provide through statute for some type of board of health in districts and one State does so by generally accepted practice.

There are three general types of boards of health established in areas comprising health districts: (a) A district board of health repre-

senting all constituent areas within the district; (b) both a district board of health and separate boards for each constituent area; and (c) a separate board of health for each constituent governmental area within the district (table 2).

Twenty-nine States provide for the first type by statute. Five States have statutory provisions for district boards of health which provide that the district board be composed of members of the several separate boards of health of the individual governmental areas of the district. Under such a plan, each constituent area has a separate board of health and also has representation on the district board. Two States provide by statute for a separate board for each constituent area, and one State does so by commonly accepted practice.

Appointment of Boards

Statutes sometimes name certain local legislative or administrative officials who shall constitute the board of health, or in other instances the responsibility for the appointment of the board may be delegated by law to either the local legislative body or some administrative official. The State health officer or the State board of health appoints local boards of health in a few States. Representatives on district boards of health are generally appointed either by the local legislative body or an administrative official of each constituent governmental unit in the district. Sometimes members of

Table 2. Number of States in which district boards of health are provided by statute or common practice, by type of board

Type of board	Statute ¹	Common practice
District board representing all constituent areas.....	29 (2)	-----
Both a district board and separate boards for each constituent area.....	5 (3)	-----
Separate board for each constituent governmental area.....	2 (1)	1
Total.....	36 (6)	1

¹ Figures in parentheses indicate the number of States included in the tabulation in which the provision is applicable only to certain governmental areas or only under certain conditions.

the legislative body or an administrative official of each constituent area serve on the district board.

Almost universally State health officers in commenting on the method of appointing local boards of health indicated that members of such boards should be appointed by the local legislative body or by an administrative officer. A few State health officers pointed out that a primary consideration was that appointments be nonpolitical in nature. The statutes of some States specifically limit the number of board members that may be from the same political party.

Local Board Representation

Table 3 indicates that 34 States have statutes which provide for professional representation on boards of health, but in 15 of these States such provisions are limited to certain areas or conditions in their application. Two States provide for professional representation by commonly accepted practice under certain conditions. Professional representation usually consists of one or more doctors of medicine, but in a limited number of States dentists and pharmacists are also included. By prescribing that certain officials constitute the board of health, some States practically preclude professional representation on such boards. Most State health officers felt that the medical profession should be represented on boards of health, but one-third of them indicated that physicians should not constitute a majority of the membership.

Nearly three-fourths of the States provide that certain local administrative officials shall be members of the board of health by reason of some other county or city office which they hold. In 14 States such provisions are applicable only to certain areas or are qualified as to the conditions under which they are applicable. Frequently, separate statutory provisions applicable to cities or to districts exist in addition to the general statutes.

Two-thirds of the States have statutes which require geographic representation on district boards of health. One State requires such representation through commonly accepted practice without a statutory provision.

Table 3. Number of States having membership or procedural requirements for local boards of health prescribed in statutes or commonly accepted practices which have general or limited application

Membership or procedural requirements	Total States with provisions		States with provisions generally applicable		States with provisions of limited application ¹	
	Statute	Common practice	Statute	Common practice	Statute	Common practice
<i>Membership requirements</i>						
Representation:						
Professional.....	34	2	19		15	2
Local administrative officials.....	34		20		14	
Geographic.....	31	1	23	1	8	
Local legislative body.....	23	1	12	1	11	
General public.....	19		9		10	
Health officer:						
Regular member.....	16	1	4		12	1
Ex-officio member.....	19	2	7	1	12	1
Not a member.....	16	4	9	3	7	1
<i>Other requirements</i>						
Residence in health jurisdiction.....	33	6	25	6	8	
Eligibility to vote in jurisdiction.....	13	6	10	5	3	1
Taxpayer in jurisdiction.....	3	3	1	2	2	1
<i>Procedural requirements</i>						
Meetings:						
Regular.....	29		18		11	
Special ²	28	5	20	4	8	1
Quorum required ²	18	9	10	5	8	4
Meetings governed by bylaws ²	15	4	5	1	10	3
Compensation of board members:						
Travel.....	17	3	11	1	6	2
Per diem.....	14	4	6	1	8	3
Salary.....	7	1	1	1	6	

¹ Refers to States where provisions are applicable only to some governmental areas or under some conditions.

² One State has regulations governing these items.

There are 23 States in which members of the local legislative body by statute constitute all or some part of the board of health, but in 11 States such representation is limited to certain conditions or areas. In one State this type of representation is established by common practice.

In recent years there has been considerable interest expressed in having the general public represented on boards of health. The questionnaires reveal that 19 States have statutory provisions requiring the general public to be represented, but in 10 of these there are limited conditions under which such representation occurs. There are 8 other States in which representation of the general public is excluded because these States generally have statutory provisions which name specific officials or mem-

bers of the legislative body to the board of health, with no opportunity for the general public to be represented. It is interesting to note that three-fourths of the State health officers commented that there should be representation of the general public on local boards of health.

One-third of the States have statutory provisions permitting the local health officer to serve as a regular member of the board of health. Twenty-one States permit local health officers to serve as ex-officio members of boards of health. However, the service of health officers as regular or ex-officio members of boards of health is usually limited to certain classes of local areas or only to certain conditions.

It is obvious from the foregoing that there is little uniformity among the States as to the

membership representation on local boards of health. Frequently, more than one of the groups mentioned are represented. Legislative members, local administrative officials, and the medical profession are the most prevalent groups included in membership. In addition, the majority of the States include the health officer as either a regular or ex-officio member of the board, although there are at least 20 States in which he is not a member of boards serving at least some local areas.

Other Membership Requirements

Table 3 also indicates that statutes in more than two-thirds of the States require members of boards of health to be residents of the health jurisdiction. In addition, six States have this requirement in practice. Statutes in about one-quarter of the States require that board members be eligible to vote in the jurisdiction, while six other States make this a practical requirement. Statutes are generally silent with respect to the requirement that board members be taxpayers in the area.

Term of Office

Wide variation exists in the term of office for members of local boards of health, although

statutes in most States prescribe the term. About one-third of the States specify terms of 2 years or less. Ten States have statutes calling for an indefinite term of membership for all or some local boards of health. It should be pointed out that a State frequently has statutory provisions which specify a different tenure for members of local boards serving counties and for those serving cities. More than half the States have statutes which provide that the expiration dates for terms of board members shall be staggered so as to give some continuity to the board.

Procedural Requirements

Statutes in 29 States specify that boards of health shall hold regular meetings and indicate the frequency of such meetings, although such provisions are of limited application in 11 States. Predominantly, meetings are held monthly or quarterly, with the latter taking some precedence over the former interval. Slightly more than half the States have statutory provisions establishing a procedure for calling special meetings of boards of health.

Statutory specification of minimum frequency of board meetings was favored by three-fourths of the State health officers. The majority stated that legal provisions should pre-

Table 4. Number of States providing for appointment of local health officers by statute or commonly accepted practice, according to type of appointing authority

Appointing authority	Total States with provisions		States with provisions generally applicable		States with provisions of limited application ¹	
	Statute	Common practice	Statute	Common practice	Statute	Common practice
Health officers of single governmental areas:						
State health officer.....	12	1	² 3	1	9	-----
State board of health.....	7	-----	2	-----	5	-----
Local board of health.....	32	3	23	1	9	2
Local legislative body.....	22	1	10	1	12	-----
Local administrative official.....	15	2	1	-----	14	2
Health officers of districts:						
State health officer.....	7	5	5	4	2	1
State board of health.....	2	-----	2	-----	-----	-----
District board of health.....	28	-----	25	-----	3	-----
Local board of health in each unit.....	4	1	4	1	-----	-----
Local legislative body in each unit.....	1	1	1	1	-----	-----

¹ Refers to States where provisions are applicable only to some governmental areas or under some conditions.

² One State has regulations in addition to statutes covering this authority.

Table 5. Number of States providing for confirmation of local health officers by statute or commonly accepted practice, according to type of confirming authority

Confirming authority	Total states with provisions		States with provisions generally applicable		States with provisions of limited application ¹	
	Statute	Common practice	Statute	Common practice	Statute	Common practice
Confirmation in single governmental areas:						
State health officer.....	11	7	7	3	4	4
State board of health.....	9	1	6	1	3	-----
Local legislative body.....	9	1	2	1	7	-----
Local administrative official.....	1	-----	-----	-----	1	-----
Local board of health.....	1	2	1	2	-----	-----
Confirmation of district health officers:						
State health officer.....	11	-----	9	-----	2	-----
State board of health.....	6	-----	6	-----	-----	-----
Local legislative body of each unit.....	4	1	2	1	2	-----
District board of health.....	-----	2	-----	2	-----	-----

¹ Refers to States where provisions are applicable only to some governmental areas or under some conditions.

scribe the minimum number of meetings, with provisions for special meetings whenever local conditions demand.

The data indicate that boards of health are required to have a quorum by statute in 18 States and by generally accepted practice in 9 other States. Only 15 States have statutes specifying that deliberations of boards of health be governed by bylaws. In addition, there are four States in which the actions of boards are so governed in practice.

In 20 of the States members of local boards of health are entitled to travel expenses either by statute or by commonly accepted practice. In 14 States they receive per diem by law, and in four other States by accepted practice. In only eight States are members of local boards of health entitled to receive salaries.

Appointment of Local Health Officers

Many States have more than one provision for the appointment of health officers. The methods of appointment are associated generally with the methods for establishing local health departments. Some statutory provision for the appointment of local health officers exists in every State, although such provisions are frequently limited in their application to certain areas or conditions. Table 4 indicates that local health officers serving units other than districts are usually appointed by the lo-

cal board of health, the local legislative body, or the State health officer. There are 20 States in which either the State board of health or the State health officer may appoint certain local health officers. However, this power is usually limited to instances in which the regular or local appointive machinery breaks down.

Health officers serving districts are appointed under statutory provisions by the district board of health in 28 States and by the State health officer in 7 States. In addition, there are five States in which district health officers are appointed by the State health officer by accepted practice. Local legislative bodies seldom appoint district health officers, and appointment by a local administrative official was not found.

Twenty-nine States have statutory provisions for the confirmation of the appointments of health officers, while nine other States follow this procedure in practice. Generally, the State health officer, State board of health, or the local legislative body is delegated the authority to confirm the appointments of local health officers. Confirmation of the appointment of district health officers occurs infrequently, but where confirmation is required the State health officer or the State board of health is usually delegated this responsibility.

The consensus of State health officers is that the local health officer should be appointed locally—either by the board of health or the legislative body. However, 28 indicate that his ap-

pointment should be confirmed by the State health officer. Twelve others recommend that he should be required to meet specifications of the State health department, but that the appointment should not actually be confirmed. Eight believe that he should be appointed by the State health officer or State board of health.

Other Provisions for Health Officers

In seven States local health officers serving some types of local health departments become deputy State health officers by law. In eight other States they hold this position through commonly accepted practice.

Statutes in nearly three-fourths of the States provide that at least some cities, towns or townships may retain a local health officer even though the governmental area itself becomes part of a larger health jurisdiction. The comments clearly indicate that State health officers generally oppose the retention of a legally designated health officer in minor governmental areas of a health jurisdiction. It is the opinion of State health officers that the health unit director should exercise the authority of health officer throughout the health jurisdiction and that any other health officers should be subordinate to him.

By statutory provisions, local health officers serving at least some types of local health departments are selected in 16 States under a merit

system. Seven additional States have regulations to this effect, and eight States select local health officers in this manner by practice. In those States in which the law specifically indicates the manner in which local health officers shall be appointed, such procedures may preclude his selection under a merit system. Thirty-nine State health officers indicate that it is desirable for local health officers to be selected under a merit system.

There is wide variation in the statutory provisions for term of office for local health officers and equally wide variation in the accepted practice where no statutory requirements exist. The questionnaires indicate that local health officers most frequently have either a 2- or 4-year term of office. There has been a definite trend in recent years for the term to be made indefinite. In several of the States with statutory provisions specifying the term of office there is actually no reappointment of health officers at the intervals specified.

Qualifications Required

More than two-thirds of the States require by law that local health officers possess the qualifications for a State license to practice medicine (table 6). In five States this requisite is specified by regulation, and in two States the requirement is by common practice. Most of the States with stipulations that the health officers

Table 6. Number of States prescribing specific qualifications for local health officers by statute, regulation, or common practice

Type of qualification	Total States with provisions			States with provisions generally applicable			States with provisions of limited application ¹		
	Statute	Regulation	Common practice	Statute	Regulation	Common practice	Statute	Regulation	Common practice
Qualified for State license in medicine ²	34	5	2	27	4	2	7	1	
Required to secure State license in medicine ²	32	4	4	25	3	4	7	1	
Provisions for temporary licensure in medicine	11	1	2	11	1	2			
Full-time service	31	3	5	12	2	3	19	1	2
Training in public health	17	8	2	7	4	1	10	4	1
Experience in public health	7	10	1	2	8	1	5	2	

¹ Refers to States where provisions are applicable only to some governmental areas or under some conditions.

² Required by regulation in two States as well as by statute.

Table 7. Number of States with statutes or commonly accepted practices designating governmental authority to which local health officer is responsible, by type of authority

Type of authority to which health officers are responsible	Total States with provisions		States with provisions generally applicable		States with provisions of limited application ¹	
	Statute	Common practice	Statute	Common practice	Statute	Common practice
Responsible authority in single governmental areas:						
State health officer.....	19	2	18	2	1	-----
State board of health.....	8	-----	7	-----	1	-----
Local board of health.....	35	4	27	2	8	2
Local legislative body.....	12	4	6	4	6	-----
Local administrative officer.....	9	2	2	1	7	1
Responsible authority in districts:						
State health officer.....	13	3	13	3	-----	-----
State board of health.....	1	-----	1	-----	-----	-----
District board of health.....	29	3	28	3	1	-----
Each constituent governmental area.....	3	4	2	4	1	-----

¹ Refers to States where provisions are applicable only to some governmental areas or under some conditions.

qualify for a State license actually require them to secure the license. Only 11 States make statutory provisions for temporary licensure of health officers, one additional State provides for such licensure by regulation, and two States do so by practice.

The laws of 31 States require at least some health officers to serve full time though such statutes are generally limited in their application (table 6). In addition, three States have regulations requiring full-time service and five States require it by accepted practice. Frequently, the regulatory requirement or practice of requiring full-time service of local health officers is related to the health department's eligibility for State financial assistance.

Twenty-seven States require public health training of local health officers serving at least some types of health departments. Such requirement is twice as frequently specified by statute as by regulation. Usually, the provision is general, not specifically stating the amount or kind of training required.

Only 7 States require by statute that health officers have experience, but 10 States have regulations requiring experience. The present shortage of qualified health officer personnel has made difficult the enforcement of experience requisites in existing statutes and regulations.

The majority of State health officers were opposed to defining qualifications of local

health officers in statutes. The major objection indicated was that specificity in this matter makes conditions too rigid and hampers the recruitment of personnel. Many indicated that qualifications, if defined, should be set forth in State health department regulations rather than in statutes. A number favored a flexible system, with required training and experience commensurate with the size and complexity of the individual health unit. Nearly all State health officers felt that local health officers should be legally licensed physicians. Several State health officers indicated that such items as personality, administrative ability, interest in community health, and ability to get along well with people are more important than specified training or experience backgrounds.

Responsibility of Local Officers

Table 7 indicates that State statutes and practices hold local health officers responsible to several types of governmental authorities. In many instances the health officer is responsible to more than one authority and is frequently responsible to some authority other than the one which appointed him. In most cases when dual responsibility exists, the health officer is responsible to some local authority and to the State health officer. Table 7 indicates that the local health officer is most frequently responsible to

the local board of health or to the State health officer.

The data also reveal that district health officers are infrequently responsible to the separate governmental areas comprising their district, but are usually responsible to the district board of health or to the State health officer.

Governmental Basis of Health Units

For several years health experts have been interested in the types of local governmental areas which may establish health departments. There are now 42 States which have statutes making it possible to establish single county health departments. The six States which have no legal provisions for establishing single county health departments are located primarily in the New England area where the county as a local governmental area has practically no meaning. The establishment of single county health departments is mandatory in four States. Laws governing the establishment of city health units are in effect in 44 States and such units are established in common practice in 1 other State. In eight States it is mandatory for all or some cities to establish local health departments, while in four States cities are not permitted to establish separate health departments.

The fact that most counties in the United States have insufficient population and financial resources to meet the high costs of maintaining a separate local health unit, plus the shortage of qualified health officers, has spurred the development of district health departments to serve more than a single local governmental unit. Legislation is usually necessary to permit local governmental areas to combine and form a district for the operation of a health department. There are now 34 States which have statutes permitting 2 or more counties to form a multicounty health department; in 2 States such districts have been formed without specific legal authority. There are 27 States which have legislation permitting the creation of city-county health departments, and 5 States have established this type of district in practice without specific statutory authority. These foregoing two types of district health depart-

ments are the most prevalent, but statutes exist in several States which permit the formation of other types of districts. The laws of 15 States permit multicounty units and a like number permit multitown or multitownship units; 11 States permit the combination of cities and townships; 10 States permit the combination of counties, cities, and townships; and 8 States permit the combination of counties and townships. In addition, a few States have established these more unusual types of districts in practice although no statutory authority exists.

Methods of Establishment

There are several methods by which local health departments may be established. Local health departments serving either single units of government or those serving multiple governmental areas are most frequently established through action of the local legislative body or, in district areas, of each constituent legislative body within the district (table 9). The second most popular method is by referendum of electorate. This method is permitted by law in 16 States with respect to single governmental

Table 8. Number of States having permissive or mandatory authority for the establishment of local health departments, by type of governmental area¹

Type of governmental area	Permissive authority ²		Mandatory authority ²	
	Statute	Practice	Statute	Practice
Counties.....	38 (2)	-----	4 (2)	-----
Cities.....	36 (4)	1	8 (5)	-----
Towns or townships....	16	1	2 (1)	-----
Districts:				
Multicounty.....	³ 34 (1)	2	1	-----
City-county.....	27	5	-----	-----
Multicity.....	15	2	-----	-----
Multitownship.....	15 (2)	2	-----	-----
City-township.....	11	3	-----	-----
County-city-township.....	10 (1)	3	-----	-----
County-township.....	³ 8 (1)	2	-----	-----

¹ Authority for establishing local health departments is not prescribed by regulation in any State.

² Figures in parentheses indicate the number of States included in the tabulation in which the provision is applicable only to certain governmental areas or only under certain conditions.

³ In 1 State statute is applicable under certain conditions and practice is applicable in other situations.

Table 9. Number of States providing specific procedures for the establishment of local health departments by statute or commonly accepted practice

Type of procedure	Total States with provisions		States with provisions generally applicable		States with provisions of limited application ¹	
	Statute	Common practice	Statute	Common practice	Statute	Common practice
Single governmental areas:						
Action of local legislative body	37	4	22	3	15	1
Referendum of electorate	16	1	13		3	1
Action of State legislature	5		3		2	
Action of State health officer	4	2	3	2	1	
Other procedures	2	1			2	1
Multigovernmental areas:						
Action of local legislative body of each constituent unit	35		22		13	
Referendum of electorate	17		14		3	
Action of State health officer	8	4	6	4	2	
Approval of local authorities required	3	2	3	2		
Action of State legislature	2		2			
Other procedures	6		6			

¹ Refers to States where provisions are applicable only to some governmental areas or under some conditions.

areas and in 17 States with respect to multiple governmental areas. This plan normally requires that a certain percentage of electors submit a petition asking that the question of creating a local health department be placed upon the ballot. Local health units of either the single-unit type or district type are infrequently established by action of State health officers or State legislatures, although such methods are permitted by law in several States.

It is the opinion of State health officers that the establishment of local health departments is a matter for local determination. A few State health officers indicated that State legislative action should make them mandatory. Local legislative action or local referendum, or a combination of the two, were deemed by State health officers as the most expedient methods for initiating action to establish local health departments. The same general methods were favored for the establishment of district health departments. More State health officers, however, felt that in order to foster some logical plan for state-wide districting, such departments should be subject to the approval of the State health officer.

Dissolution of Local Units

Statutes usually fail to specify the manner in which local or district health departments may

be dissolved. In 15 States there are no statutory provisions for the dissolution of health units. Action by the local legislative body is the most frequent method employed to dissolve a health department; 15 States have such statutory authority with respect to single governmental units and 13 States with respect to multigovernmental units. Such action is taken by commonly accepted practice in 13 States for single county units and in 11 States with respect to district health departments (table 10). Referendum of the electorate is the second most popular method for dissolving local health departments, with 6 States making this method applicable to single governmental areas. Seven States provide by statute for the dissolution of districts by referendum action of the electorate of the whole jurisdiction while 6 States provide for referendum of electorate of each constituent area. In several States it is most difficult to dissolve a local health department once established.

State health officers feel that dissolution should be by the same procedure as establishment. Several indicated, however, that a health department should be in operation for at least a reasonable period of time before dissolution should be permitted. Many who indicated that establishment should be by either referendum or local legislative action were of the opinion

that dissolution should not be permitted without referendum. The majority of State health officers felt that the desirability of withdrawing from a district should be determined by each governmental unit. However, they also felt that provisions should be made for a waiting period, or a period following notification of withdrawal, to allow for adjustment in the remainder of the unit.

Table 11 indicates that only 4 States require all governmental units within a county or district health jurisdiction to join the health department. There are 10 States in which statutory provisions permit any type of city to remain outside county or district health departments; 10 additional States permit cities of specified population size to do so, and 7 States permit cities to remain outside the county or district unit if they have a health department of their own. There are a few States in which towns may also remain outside the county or district health department. On the other hand, almost three-fourths of the States permit cities and towns to join the county or district health jurisdiction,

Table 11. Number of States having provisions of statute and practice permitting local governmental areas to remain outside county or district health jurisdiction, by type of local governmental area

Type of governmental area permitted to remain outside county or district health jurisdiction ¹	Statute	Common practice
None.....	4	-----
Cities of any type.....	10	-----
Cities of certain classes or population size ²	10	-----
Cities with a health department.....	7	-----
Any city, county, or town.....	5	2
Cities or towns.....	4	2
Towns.....	2	-----

¹ Since the basic governmental unit in New England is the town, the data for these States have been included in the same category as county data for the other States.

² One other State has statutory provision permitting counties of certain population size to remain out of districts.

and 9 additional States do so in practice without statutory provisions.

Statutory provisions require that districts serve contiguous local governmental areas in

Table 10. Number of States providing specific procedures for the dissolution of local health departments by statute or commonly accepted practice

Type of Procedure	Total States with provisions		States with provisions generally applicable		States with provisions of limited application ¹	
	Statute	Common practice	Statute	Common practice	Statute	Common practice
Procedures in single governmental areas:						
Action of local legislative body.....	15	13	9	10	6	3
Referendum of electorate.....	6	3	4	3	2	-----
Action of State health officer.....	-----	7	-----	5	-----	2
Approval of local authorities required.....	-----	4	-----	3	-----	1
Action of State legislature.....	3	-----	1	-----	2	-----
Other procedures.....	10	-----	10	-----	-----	-----
Procedures in district areas:						
Action of local legislative body of each constituent unit.....	13	11	9	9	4	2
Referendum of electorate of whole jurisdiction.....	7	1	5	1	2	-----
Referendum of electorate of each constituent area.....	6	2	5	2	1	-----
Action of State health officer.....	2	8	1	8	1	-----
Approval of local authorities required.....	2	6	1	6	1	-----
Action of State legislature.....	1	-----	1	-----	-----	-----
Other procedures.....	7	-----	7	-----	-----	-----

¹ Refers to States where provisions are applicable only to some governmental areas or under some conditions.

Table 12. Number of States prescribing criteria by statute, regulation, or commonly accepted practice that must be met in order to be eligible for State financial assistance

Criteria prescribed	Total States with provisions			States with provisions generally applicable			States with provisions of limited application ¹		
	Statute	Regulation	Common practice	Statute	Regulation	Common practice	Statute	Regulation	Common practice
Mandatory staffing.....	² 6	4	11	4	4	10	² 2	-----	1
Specific services.....	3	4	12	1	4	7	2	-----	5
Plan required.....	2	1	15	2	1	12	-----	-----	3
Plan must have State approval.	2	1	12	2	1	12	-----	-----	-----
Minimum population.....	2	2	5	1	2	3	1	-----	2

¹ Refers to States where provisions are applicable only to some governmental areas or under some conditions.

² In 1 State mandatory staffing is required of districts by statute and of other local health departments by practice.

22 States; 5 additional States require such an arrangement by commonly accepted practice.

Only 5 States have statutory limitations as to the number of governmental areas which may combine to form health districts. Also, such limitations are infrequently imposed in practice.

State Financial Assistance

There has been some interest in recent years in the development of criteria which local health departments should meet in order to be eligible for financial assistance from the State. Such criteria generally include mandatory staffing requirements. Table 12 indicates that such staffing requirements are specified by statute in six States and by regulation in four others. In practice, there are 11 additional States which require local health departments to employ certain types of personnel.

A second criteria involves basic services which local health departments are required to render. Nineteen States have some requirements with respect to basic services, but in only 12 States are they generally applicable and in those they are usually applied in practice rather than by statute.

Local health departments infrequently are required by statute to submit a plan of action. However, nearly one-third of the States require such plans in practice. If a plan is required of the local health department, it is generally subject to approval by the State.

Criteria for State financial assistance sometimes include a minimum population which the department should serve, but only nine States require local health departments to serve a minimum population.

Summary

While most States have some statutory provisions for the creation of boards of health, the appointment of local health officers, and the establishment of local health departments, there is wide variation between the several States in the details of the statutory provisions. Basically, statutes provide for boards of health either appointed by or composed of members of the local legislative body, or local administrative officials. These boards generally have the responsibility of designating the local health officer who directs the local health department program. The health officer is usually responsible to the authority which appointed him, but, in addition, may be responsible to other local authority and particularly to the State health officer.

Most States have statutory provisions which permit the establishment of county or city health departments through action of the local legislative body or through popular referendum. Only about three-fourths of the States, however, have such legislation permitting the establishment of health districts serving more than a single local governmental area.

Abatement of Stream Pollution Caused By Industrial Wastes

By ROLF ELIASSEN, D.Sc.

INDUSTRIAL wastes, varied in nature and potent in strength, have been with us for a long time. But in recent years they have been increasing in volume and variety at a rapid rate.

Legislation is pressing industry and municipalities to abate the pollution of streams by controlling or treating their wastes. The times call for rational, economical decisions. To make them, every sanitary engineer needs to know a great deal more about the fundamentals of the sanitary engineering profession and its relationship to industrial wastes.

Throughout the years, sanitary engineers and sanitary scientists have developed and put into practice treatment processes involving chemical, physical, and biological phenomena characteristic of domestic sewage. Domestic sewages do not differ much, unless mixed with industrial wastes. And many civil engineers, with only a rudimentary knowledge of design criteria for treatment plants, can adopt the regulations of State health departments and proceed with plant designs. Through the efforts of sanitary engineers in these departments, design criteria have been made sufficiently liberal to insure adequate treatment under average conditions.

Dr. Eliassen is professor of sanitary engineering at the Massachusetts Institute of Technology and served as an advisory member of the United States delegation to the Fifth World Health Assembly in May. This paper is based on a presentation before the American Society of Civil Engineers, October 23, 1951, at New York City.

Changing Needs

In recent years special problems have put new demands upon the ingenuity of sanitary designers and operating personnel. This is particularly true in cities having appreciable proportions of industrial wastes mixed with domestic sewage. Research has led to more economical and more easily operated processes, and many excellent treatment plants are in operation. Furthermore, many sanitary engineers are set to meet new demands from industry. But it must be conceded that rule-of-thumb engineering no longer applies successfully to the design of treatment plants for sewage and industrial wastes. This method may have done a good general civil engineering job for municipalities, but it may fail to abate water pollution if it is applied to industrial wastes.

Rarely will wastes from similar industrial establishments be exactly the same from plant to plant. They may fall into similar categories, but the concentrations and individual components may be far apart. Each waste requires special analysis and an approach based upon a sound knowledge of each unit operation which may be applicable in a treatment process. Rule-of-thumb approaches may lead to plants which may not operate properly or may not even accomplish the assigned task.

Engineer Cooperation

Many industrial wastes can be eliminated by process revisions within the industrial plant. In many cases, this is within the province of the chemical engineer. The field of wet-process

engineering, particularly within chemical and allied industries, is the province of the chemical engineer. This profession is gradually coming to realize that cutting down the volume and strength of industrial wastes is their responsibility.

Sanitary engineers must cooperate with chemical engineers in this work, and it is necessary for them to learn enough about the chemical engineering field to make that cooperation intelligent and beneficial. After chemical engineers have completed process changes within the limits of economics, many plants find it necessary to discharge liquid wastes having sufficient concentration of pollutants to require treatment. The determination of the economics of process changes versus treatment of wastes, either individually or when mixed with municipal sewage, can best be accomplished by close cooperation between chemical engineers and sanitary engineers.

The sanitary engineer has wide experience with chemical and biological processes for the removal of dilute concentrations of solids, both organic and inorganic, from liquids and the processing of these solids for ultimate disposal. His is also the best qualified profession to deal with problems of stream sanitation, including the biochemical processes of stabilization of organic matter in streams. Toxicity of the constituents of industrial wastes to the biological population of streams has been the subject of extensive studies by sanitary engineers and sanitary scientists. One of the most important contributions of the sanitary engineer to the economics of waste treatment is his knowledge of the capacity of municipal sewage treatment plants and of streams to absorb organic pollutants. Thus, his education and experience can be utilized for the evaluation of the extent of treatment required before industrial wastes may be discharged into municipal sewers or directly into streams and for the design of plants to accomplish this treatment.

Tailor-Made Solutions

There can be no pat formulas, no magic keys to success, for solutions to the hundreds of categories of industrial wastes which must be treated and bodies of water which must be pro-

tected. The quality of sanitary engineering service will be judged by the thoroughness with which each problem is approached and the ingenuity with which economical processes are developed and effective treatment plants designed. In most cases, satisfactory solutions can only be attained by complete chemical and physical analyses of the wastes, which are correlated with existing information in the literature of sanitary engineering and followed by laboratory and perhaps pilot plant tests. The day of reference to time-worn design criteria for a general class of wastes is past. Each problem demands particular attention and a tailor-made solution.

Each unit operation of the sanitary engineer must be based on the application of sound principles of the fundamental sciences of chemistry, biology, physics, and mathematics if effective and economical processes are to be developed. Therefore, the sanitary engineer must not only be qualified by his basic education in civil engineering to conceive and construct hydraulic structures, but he must also be well educated in the sanitary sciences built upon biology and chemistry. The major difference between a chemical engineer and a sanitary engineer is the primary reliance of the former on physical and chemical phenomena in his operations, whereas the sanitary engineer has command of biological as well as physical and chemical actions in the unit operations employed in sanitary engineering processes. In some instances, the sanitary engineer may be classified as a biochemical engineer to distinguish him from the chemical engineer.

Therefore, sanitary engineers of the present and of the future must be far ahead in the field of biochemistry. They can only achieve this knowledge by a concentrated program of scientific education in colleges and continued study while engaged in the practice of sanitary engineering. The sanitary engineer cannot go it alone. He must have qualified sanitary chemists and sanitary biologists as members of his team. With the right combination of talents in these three major realms of sanitary engineering, this team can give distinguished service to industry and government in the abatement of stream pollution by the control and treatment of industrial wastes.

Research Uses

This team of engineers, chemists, and biologists must not only be devoted to the solution of existing problems by known unit operations in the design and operation of treatment processes, but must also be constantly striving for effective utilization of the phenomena of the fundamental sciences. Research in sanitary engineering has led to the present high standards of treatment of sewage and industrial wastes. The field for research is open for the development of rapid methods for the fermentation of organic wastes by aerobic and anaerobic processes. Witness the great strides being made by biochemists and soil microbiologists in the fermentation processes employed for the production of antibiotics. In a few short years, they have succeeded in increasing rates of production tenfold. Can we say the same for our biochemical processes? We should be and must be able to accomplish rapid fermentation so that processes may be economical and widely applicable to many wastes now outside the realm of treatment by our various unit operations.

We are necessarily faced with expanding horizons for our research workers who must incorporate many of the unit operations utilized by chemical engineers, such as absorption, extraction, distillation, evaporation, and others. The sanitary engineer and the chemical engineer must cooperate in developing processes utilizing the best of knowledge and experience from both professions.

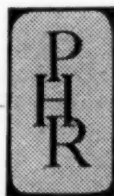
Conclusion

Our keenest brains must be applied to the problems encountered in the treatment of industrial wastes and the abatement of stream pollution. Engineers must also divest them-

selves of any lingering illusion that they can quietly go their own fixed ways of applying empirical formulas to categorical problems. But we must be prepared to be patient and persistent in the pursuit of knowledge of the fundamental sciences to be applied to the critical problems of so very many different industrial wastes. We cannot afford to be thrown off balance by the demand for quick answers and simple methods. Proper solutions take time and cost money. Therefore, consulting engineers must be prepared to educate their clients to the need for sufficient funds and time to do the job thoroughly.

Allies in the fields of chemistry, biology, and chemical engineering must team up to make the changes deemed economical and necessary within the plant and then to apply their joint talents to the treatment of the liquids which must be discharged to streams of municipal sewers and treatment plants. Through knowledge of the principles of physical, biological, and chemical unit operations, and of stream sanitation, sanitary engineers must demonstrate that they can by economical design and operation make streams safe from the standpoint of public health, recreation, and beneficial use of water for the industries and cities downstream.

The key to future success lies in continued development through the application of the fundamental sciences. The cost of failure of the rule-of-thumb engineer to understand these fundamentals may be staggering. Therefore, let the sanitary engineer team up with the chemist, the biologist, the physicist, and the chemical engineer, and the future will hold great promise for more economical treatment processes and effective abatement of stream pollution.



The Movement Toward Sound Drug Therapy

1952 marked the celebration of the 100th anniversary of the founding of the American Pharmaceutical Association. It marked, as well, a step toward eliminating the confusion existing in the multiplicity of drugs available to physicians, dentists, and pharmacists. A new handbook, synthesizing the best available in modern drug therapy, was completed. "Basic Drugs: U. S. Public Health Service Hospitals and Clinics" will be used by the 18 hospitals and 22 out-patient clinics of the Public Health Service as their standard for the known therapeutic agents in the prevention and treatment of illness. The accompanying paper was presented, with somewhat more emphasis on the role of the pharmacist in the hospital, before the American Society of Hospital Pharmacists at the annual meeting of the American Pharmaceutical Association in Philadelphia on August 21, 1952. Reviewed below is the trend of professional criticism appearing in medical and trade journals over several decades.

1930 "The hospital . . . should afford unusual opportunities for enhancing rational drug therapy. There particularly may products be submitted to critical inspection. As Sollmann so pointedly remarked at the recent Congress on Medical Education [February 17-19, 1930], the 'evaluation of therapeutic remedies is not usually among the features to which hospital authorities point with just pride of achievement.' The hospital drug room, which reflects directly the medicinal requests of the staff, has hardly kept pace with the modernization of other departments. . . ."

—from an editorial in the *Journal of the American Medical Association*, May 31, 1930, p. 1764.

1941 "There is far too little correlation between pharmacology and drug therapy at the bedside. . . . As students and, subsequently, as practitioners they [physicians] had, and have the ordeal of trying to learn myriads of drugs. . . . Such thinly spread teaching and learning about hosts of drugs permeates the whole curriculum and medical practice in spite of available scientific criteria for charting drug actions in the clinic which make it possible, in most instances, to shun useless and irrational therapy. The results are particularly reflected in notoriously disreputable pharmacy stocks. . . ."

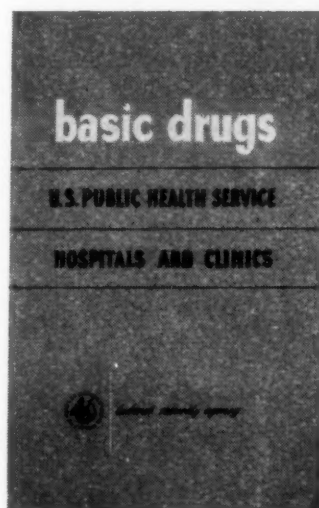
—from "Rational Drug Therapy in Hospitals" by Drs. M. S. Dooley and E. C. Reifstein in *Hospitals*, January 1941, p. 42.

1949 "A fundamental requirement to successful treatment is that the physician have the clearest possible understanding of the remedial agents that he prescribes. This is difficult at best, and is rendered increasingly difficult with multiplication of agents that are nearly but not quite equivalent. Each may show minor differences, which may or may not be practically important, but which are difficult to learn if he spreads his experience too widely and therefore too thinly. . . . There is another side to the argument, however, for few if any therapeutic agents are ideal. Improvements, increased efficiency, fewer side actions, and lower toxicity should be sought for. Skillful experimentation in this direction should be encouraged, not obstructed, but this thorough experimentation should precede the introduction into medical practice. It were better, much better, for medical practice . . . if modifications which do not offer substantial advantages were shunted into the discard before they see publicity and add to the confusion of practitioners."

—from a report of the Council on Pharmacy and Chemistry, American Medical Association, *Journal of the American Medical Association*, February 5, 1949, p. 378.

An Objective Approach to Drug Therapy

By J. SOLON MORDELL, B.A., Ph.G., and C. K. HIMMELSBACH, M.D.



In April 1952, Paul deHaen reported on pharmaceutical products introduced in the years 1948 through 1951. His report was based on a survey he made of trade and medical journals (1). The 1951 data are illustrative of the preceding 3 years. Among the 322

pharmaceutical products introduced by 86 manufacturing firms in 1951, there were 35 different single chemicals, or about 11 percent of the total. Also, deHaen found 74 instances of duplication of single chemicals—23 percent of the products introduced. And of especial note is this: There were 211 compounded items—66 percent of the 322 total different products introduced. In addition, there were 120 new dosage forms.

Here is telling evidence of how the word "new" has been abused in the field of drug

therapy. Such abuse calls for a distinction between what is really "new" in the sense that penicillin was new in 1943 and that which is a mixture of known drugs marketed under a new name or a duplication of the "new" drug under other names.

Without knowing at what rate drugs become obsolete and unavailable, we are convinced that the net effect is the addition of more and more drugs each year. Thus, discriminate selection becomes increasingly difficult by virtue of numbers alone, and the state of confusion is compounded.

With this vast numerical growth, and the rapid progress in therapeutics—for example, cortisone, aureomycin, chloromycetin, terramycin, isoniazid, in but a few years—there comes the need for improved procedures for clinical assessment. The problem is that of devising the best method whereby the physician and the dentist may be assisted in the difficult task of selecting suitable agents from the multiplicity of drugs and drug preparations which confront them.

The professional interdependence of medicine, dentistry, and pharmacy has been recognized for a long time. We have observed, in the Public Health Service, the development of a wholesome working interrelationship among the three sciences in their common search for an objective approach to sound drug therapy and to uniform drug nomenclature. Early in 1953, the Public Health Service will release "Basic Drugs: U. S. Public Health Service Hospitals and Clinics" (2), a handbook of drug therapy which is in every sense a significant achievement in meaningful teamwork. The climax of 4 years' cooperative study, its publication represents a noteworthy advance in

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the satisfying exercise of professional cooperation in trying to make some order out of a confused situation.

Can some order be achieved? How?

Valuable sources of information are available in the standard pharmacological texts and in "New and Nonofficial Remedies" of the American Medical Association; "Reports of the Council on Pharmacy and Chemistry of the American Medical Association"; "Accepted Dental Remedies" of the American Dental Association; and "Useful Drugs" of the Council on Pharmacy and Chemistry of the American Medical Association.

Formularies and other types of drug listing have been individually compiled in many hospitals. However good these listings may be for the specific purpose for which they were designed, many serve mainly as convenient references to indicate the items available in an individual institution. Often, they lack the important features of selectivity and simplification based on fundamental scientific clinical pharmacology. Furthermore, they frequently fail to include a base—a point of departure, a set of criteria—so necessary for an orderly approach to sound drug therapy.

"Standardization"

We hesitate to use the word "standardization" because to many it immediately connotes rigidity. It is therefore important to stress the fact that any plan in the direction of rationalization of drug use must be flexible, even though it does require adherence to certain fundamental principles. If this one concept is not understood and kept indelibly in view, no such plan can be effective in operation: it would lack effectiveness, for our purpose, because pharmacology is a dynamic field in which important changes may and do occur rapidly; it would not work because compulsive restriction to standards leads to defeated initiative and stultified thinking.

The obvious approaches to discriminate selection of drugs would appear to be to develop and keep alive an up-to-date standardization of basic clinical pharmacology as the keystone of drug therapy; and to enhance closer profes-

sional working relationships among the pharmacist, the physician, and the dentist.

Trend Toward Objectivity

One of the earliest, if not the earliest, organized programs which aimed at collaboration with the physician in the objective selection of drug agents was conceived in 1927 in Syracuse, N. Y. Dr. M. S. Dooley, then director of the department of pharmacology of the Syracuse University College of Medicine, and now emeritus professor, inspired and guided in that early pioneering action to clear up what was a chaotic situation.

Dr. Dooley's plan was set in motion at Syracuse University Hospital in 1932 when the idea of hospital pharmacy practice in association with a pharmacy committee was relatively new. As time passed, more hospitals adopted the idea until today it is accepted by many institutions as an integral part of their professional operations. A significant portion of the historic 1937 "Report of the Committee on Pharmacy" of the American Hospital Association was related to the experience at Syracuse in improving the whole field of drug therapy.

A similar reorganization plan of drug therapy procedure was instituted in the early thirties at New York Hospital in Cornell University Medical Center, New York, N. Y. Publication of their therapeutic conferences in the *Journal of the American Medical Association* and in book form has contributed much to the literature on this subject.

Handbook of Drug Therapy

Late in 1948, the Division of Hospitals in the Public Health Service Bureau of Medical Services initiated the preparation of a handbook which would embody primarily the principles of a sound but flexible system of drug therapy in the 18 hospitals and 22 out-patient clinics now administered by the division. The final handbook would in no way be limited to a list of items in the manner of the traditional formulary. The goal was improved therapy—a goal to be accomplished by cooperative effort which would discredit any implications of interference with personal prerogative.

Thirty-four Public Health Service officers, professionally representing medicine, dentistry, and pharmacy, contributed to the finished text of the new handbook, "Basic Drugs: U. S. Public Health Service Hospitals and Clinics." The pharmacy committee at the Public Health Service out-patient clinic in Washington, D. C., spearheaded the project with close support from the pharmacy committees of the Public Health Service Hospital in Baltimore, Md., and of other Service hospitals. Also, authorities in a number of leading universities and teaching hospitals were consulted.

The main objective of the study was to select the best, the simplest, the fewest, and the safest medicines currently needed in the prevention, diagnosis, and treatment of illnesses. In accomplishing this, the chief task often was one of eliminating duplication and overlapping of items rather than that of sorting out the good from the bad or indifferent. This was a difficult and time-consuming process, especially when it sometimes involved, as it did, giving up a favorite drug which had been successfully utilized over a period of years. As expected, most of the difficulties arose in those areas where fundamental knowledge was not truly adequate and where differing views were advanced by the "experts." In certain of such areas, the drugs selected represent compromises.

Selection Criteria

The following criteria were utilized in the selection of drugs for the handbook:

1. The primary criterion was therapeutic efficacy. Within this criterion, preference was given to items listed in "United States Pharmacopeia," "National Formulary," "New and Non-official Remedies," and "Accepted Dental Remedies."
2. Unnecessary duplication was avoided.
3. Drugs of secret composition were not considered.
4. Mixtures were included only when they provided substantial advantage over the individual components.

Barbiturates: An Example

In considering the scope of drugs to be selected, attention was given to the drugs repre-

sentative of the various pharmacologic or therapeutic groupings and the clinical needs to be met.

Typical of the selection process is the sequence of activities which led to the choice of certain barbiturates as basic hypnotics and sedatives:

1. The barbiturates, as a class, were compared with other U.S.P., N.F., N.N.R., and A.D.R. hypnotics and sedatives. It seemed clear that for general usefulness, the barbiturates represent the surest, simplest, and safest of the hypnotic and sedative drugs. Their range of usefulness extends from mild sedation through spasmolysis and hypnosis to general anesthesia. The therapeutic range of safety is relatively great, most of the unfortunate sequelae being deliberate rather than accidental.

2. Since the nature and degree of effect are largely a function of dosage, the truly basic differences which exist within this class relate to the rate at which they are rendered inactive in the body. This, in turn, affects their duration of action. From the standpoint of therapeutic need, clinicians agreed on four ranges of action: Short, intermediate, long, and ultra-short (anesthetic).

3. Selection of the best agents to meet these needs became the next stage in the process. After much deliberation over the qualities, reliability, official status, usage experience and related aspects, the choices in the short and long ranges were secobarbital and phenobarbital, respectively. Thiopental was the obvious choice for the ultra-short representative. However, most of the discussion centered upon the selection of a barbiturate of intermediate duration of action. After the pharmacy committee discussion narrowed the field to two drugs, the opinions of specialists and consultants were requested. It became clear that custom had been the determining factor in most instances. Since the balance in terms of familiarity of usage and in certain aspects of consistency of action seemed to favor pentobarbital, it was selected as the basic barbiturate for intermediate duration of action.

4. The next step was to prepare the material on this subject for incorporation into the manual. The pharmaceutical, chemical, pharmacologic, toxicological, and dosage information considered essential to the clinician, pharmacist, and nurse were prepared and presented to the pharmacy committee for comment, criticism, and suggestions. When a draft had been agreed upon, it was duplicated and given to the staff as a trial guide, and the pharmacy stocks were adjusted in line with the agreement. After a brief trial period of several months had shown that therapeutic needs were adequately met, the material was made available for joint consideration with the pharmacy committee of the Public Health Service Hospital in Baltimore. Subsequent to agreement with that committee, the material, along with the remainder of the manual, was sent to each major clinical facility of the

Public Health Service, and to national authorities, for their consideration.

5. The suggestions and criticism resulting from these reviews were integrated into the final product. This, in turn, was carefully scrutinized by the headquarters staff with especial reference to the actions which had been taken on the comments and suggestions received from the field stations.

Thus, in the processing of the material and the selection of the basic drugs in the class of barbiturates, as well as in all other classes, most of the clinicians in the Public Health Service have had an opportunity to have their views receive appropriate consideration. Hence, the end product truly represents one achieved by joint action and agreement.

At some future time, a significant number of physicians may find that one of these barbiturates doesn't meet normal expectations. That kind of opinion usually has meaning because it is formed from adequate, first-hand observation. It is an opinion which cannot be formed easily or reliably when a large number of like drugs are used without regard to relative advantage and the unnecessary duplication which may exist. It gives the pharmacy committee and the clinician a basis for reevaluating the drug, perhaps leading them to seek a replacement, or possibly a supplementary drug. They may find that the agent in question, despite its shortcomings, should be retained because it is the best available drug for the purposes required. Thus, the whole approach is kept as scientific, objective, and independent as this field permits.

The Scope of Basic Drugs

The treatment given the barbiturate group is illustrative of the other groups. The items finally selected then form the basis for the pharmacy supply of drugs and drug preparations. Except for nonbasic drugs temporarily stocked for investigational or other special committee-authorized purposes, the drug supply consists of the basic agents.

The field of drug therapy being what it is, additions or deletions are to be expected, and the clinician is encouraged to propose changes. A request for an addition is placed on the agenda for a forthcoming pharmacy committee meeting. When the prescriber finds it necessary

to use the drug before the scheduled committee discussion, a small supply is obtained for the particular patient if none of the available basic drugs is found adequate and if there is no immediate, serious objection to the proposed drug. At the meeting, the clinician requesting the drug presents the reasons for wishing to use it. After a general discussion, the pharmacy committee may vote for acceptance, denial, or a trial period of tentative acceptance.

This procedure does several things:

It maintains freedom of action for the prescriber within the framework of the scope of basic drugs.

The prescriber is encouraged to think through the reasons for wishing to add drugs or to drop previously accepted ones. If a proposal cannot stand on its merits in a free discussion among colleagues, there should be little regret about its demise.

The pharmacist, as a committee member and consultant in drug therapy matters, is given greater opportunity to apply his professional competency.

The adopted coverage, as presented in the new handbook, provides a standard of comparison for the evaluation of new therapeutic agents.

Finally, the adoption of a basic range of therapeutic agents and the procedure for going beyond it help provide the patient with the best in the way of established drug therapy.

Two examples may serve to illustrate the validity of this approach:

Surgeons have need for a safe, reliable, orally effective relaxant of skeletal muscle. A new drug reputed to have such effect was proposed for trial on certain patients selected with the cooperation of the chief of the surgical service. Disappointing results were reported about a year later to the pharmacy committee with a recommendation against stocking the drug in the pharmacy.

Surgeons also have need for a good sympatholytic agent. Here, too, they tried out the agent of their choice and reported the results. In this instance, however, they were impressed with the value of the drug in selected cases. Their recommendation that it be stocked as a nonbasic drug for such use and for future reevaluation as a possible basic drug was accepted.

Nomenclature

Drug names were another problem in the efforts to devise a procedure for promoting sound

drug therapy. There is the professional and economic problem of multiple drugs and drug preparations which differ in name only. There is also an element of safety to be considered.

Is it not as important to have a standard terminology for drugs as it is to have a standard terminology for names of diseases, for causes of death, and for the anatomy of the body? Accurate communication with respect to drugs is certainly of highest importance here and extends beyond that which exists between physician and pharmacist.

Various texts, devised as aids to medical terminology, have been prepared for the use of medical record librarians. But when it comes to drug names, the medical record librarian has met with frustration. The situation is of even greater concern to the nurse, who has to administer drugs. With these problems in mind, the following principles of drug nomenclature were adopted:

1. Official drugs listed in the "United States Pharmacopeia" or in the "National Formulary" are referred to by their official English titles. Examples are:

Hydrous wool fat—*not* lanolin.

Methyl salicylate—*not* wintergreen oil, *nor* gaultheria oil, *nor* betula oil, *nor* sweet birch oil, *nor* teaberry oil.

2. Nonofficial drugs listed in "New and Nonofficial Remedies" of the American Medical Association and in "Accepted Dental Remedies" of the American Dental Association are referred to by the generic, nonrestricted name assigned by the drug councils of the two professional associations. For example, chorionic gonadotropin, the N.N.R. generic name, is used instead of the numerous names listed for this agent.

3. In some instances, an official drug such as naphazoline hydrochloride having the trade name Privine Hydrochloride, or an N.N.R. drug such as lidocaine hydrochloride with the trade name Xylocaine Hydrochloride, is produced by one manufacturer and is obtainable only under the trade name. Such drugs are referred to in the handbook by the official name or by the N.N.R. or A.D.R. name, as the case may be, and are followed by the trade name in parentheses. The trade name is used in hospital prescriptions to avoid ambiguity where orders are given directly to a nurse. It seemed impractical and

pedantic to use the official name naphazoline hydrochloride, for example, when the drug is obtainable only as Privine Hydrochloride. It is especially impractical in instances where ampuls bear the label or imprint of the nonofficial name. Often, the drug later becomes available under the official name or under other trade names. Then the previously exclusive trade name is dropped, and a return is made to the common base: the official name or the generic nonofficial name.

By this attention to drug names, it is possible for all concerned—physician, dentist, pharmacist, nurse, medical record librarian—to speak the same language. Moreover, the pharmacist is able to discharge a professional function for which he is trained, that is, the selection of the best drug from the pharmaceutical standpoint. No longer is there need to overload the pharmacy with many brands of the same drug or drug preparation. And as to therapy, the physician need not be concerned with much more than the selection of the therapeutic agent and the dosage. He decides, for instance, that the patient should have aluminum hydroxide gel in stated doses. The pharmacist is free to select the best available product without having to burden the pharmacy with many brands of the same item.

The Pharmacist

The success of a program of sound drug therapy depends in large measure on the professional stature of the pharmacist. To some pharmacists, as to some physicians and dentists, this type of operation may mean a departure from deeply rooted pathways of thought and action, calling for a new perspective on their part in the handling of drugs. It calls for basic knowledge not only of technical pharmaceutical functions but of drug action and drug use as well and of the differences and shortcomings which may exist among drugs. It means an awareness, for example, that witch hazel water, which would not be included in the basic drug scope, is nothing more than alcohol, water, and a witch hazel aroma—that witch hazel water will do little more than will an aqueous, 14- or 15-percent dilution of alcohol. What is most important is the ability to present

this type of information in scientific and, above all, unobtrusive fashion.

In administration of the program, it should be understood that "Basic Drugs" is not an instrument of rigid control but is essentially the sine qua non for maintaining a coordinated approach to sound drug therapy. The prescriber is encouraged at every opportunity to demonstrate his reasons for wishing to add a drug to the basic list and is not refused a drug merely because it does not appear there. The whole objective will fail if the physician or dentist is in any way discouraged from questioning the existing list. On the contrary, they should be encouraged to be analytically critical. This will serve to improve this tool and to sharpen therapeutic acumen. The goal is improved therapy—not disciplinary control.

Several courses of action are open when the pharmacist who receives a request for a non-basic drug informs the prescriber that the drug is not currently stocked:

The prescriber may ask if a drug of like action is available.

Or the occasion may be such that the pharmacist can take the initiative by suggesting the available analogous drug. The prescriber may decide to use the available drug and then find that it is the equivalent of, or better than, his first choice. Whenever that happens, it is a confirmation of our selection methods.

If there is doubt about the basic drug, the pharmacist may encourage the prescriber to present the drug originally requested to the pharmacy committee for acceptance. If the occasion demands, the pharmacist will offer to secure the nonbasic drug for the patient, subject to approval from the chief of the service, until committee action is taken.

Core of His Activities

After the system is in operation, members of the medical and dental services become familiar with the procedure, and the rest is automatic.

Once the pharmacist is relieved of accumulations of unnecessary drugs, he can then focus his attention on the drugs which he knows represent the core of his activities. He is free to acquire complete knowledge about these drugs and to consider improvements in ways of administering them.

Would this mean less work for the pharmacist? Not necessarily.

Take cough preparations as one example. There are almost as many of these as there are coughers. Under the basic drug approach, the fundamental physiology of coughing was examined and the bases for therapy were determined. Ammonium chloride was selected for its general liquefying and expectorant effect to aid the removal of sputum from the respiratory passages. Codeine was selected to depress the cough reflex when the cough becomes excessive or futile. Finally, potassium iodide, subject to certain contra-indications to its use, was selected for liquefying especially tenacious sputum which has not yielded to other measures. The responsibility for devising suitable vehicles for these agents now resides with the pharmacist whenever their administration is desired in liquid form.

This illustrates a situation calling for additional work by the pharmacist since agents used previously may have been purchased instead of having been prepared in the pharmacy.

The Open-Staff Hospital

How does a system of sound drug therapy operate in an open-staff hospital?

Usually the approved scope of drugs, previously agreed upon by the chiefs of each service in collaboration with the pharmacy committee, is used as the basis for drug therapy on ward service. It is understood that only the basic drugs are stocked in the hospital pharmacy. Nonbasic drugs prescribed for private patients are purchased (for the patient and not for "stock") without delay and in the minimum available quantity. In time, physicians who attend on ward service are able to evaluate the basic drugs used, and, once assured of their soundness, usually employ the same drugs for their private patients. Soon there is a diminishing number of special purchases of nonbasic drugs except for those under investigation.

The critical factors involved in the operation of the system in such hospitals are these: the need for prior agreement on the part of the chiefs of each service; the selection of a physician as guiding hand in the program who is aware of the problems to be tackled and the

objectives to be achieved; and the collaboration of a pharmacist with the same awareness.

Drug Manufacturers

It should be understood that a program of sound drug therapy is directed toward a logical application of drugs in the treatment of illness. The pharmaceutical manufacturer serves an indispensable function in accomplishing that aim. Manufacturers who inquire about the new program are admittedly interested in its effect on their operations, but they are soon convinced that our interest in having an opportunity to assess the new, that is, really new and potentially effective therapeutic agents, equals their interest in bringing the new drugs to our attention. As in all competitive enterprise, here too there is just as much chance for the manufacturer to gain as to lose. Proposed drugs are given every consideration. A drug which is finally adopted after organized, careful scrutiny has the substance and the chance of survival that otherwise may not obtain.

Conclusion

Thus, an attempt has been made to keep the base—the point of departure—not the end, but

the means to the end of the soundest drug therapy available at this time. The degree to which this is successful depends on an appreciation of pharmacology as the basis for sound therapy, of the need to keep the base alive and up-to-date, and of the need for professional coordination of the fields of pharmacy, medicine, and dentistry.

The purpose of the foregoing has been to enunciate a principle of operation which has been found useful, but not to stipulate either method or content in detail. The circumstances brought about by certain existing confusion in the field of drug therapy led to the development of method and content designed to meet particular Public Health Service needs, but it is believed that the underlying principle of this approach is broadly applicable.

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Children's Bureau Appointments

The appointment of Elizabeth Healy Ross, M.S.W., to the newly created post of deputy chief of the Children's Bureau and of Melvin Glasser, B.S.S., as special assistant for State and national organization relations on the bureau's juvenile delinquency project, was announced in September by the Federal Security Administrator.

Before coming to the Children's Bureau, Mrs. Ross, a psychiatric social worker, served as consultant to various Federal and District of Columbia agencies, including the National Institute of Mental Health. A member of both the American Association of Social Work and of the American Association of Psychiatric Social Workers, Mrs. Ross was elected a member of the executive committee of the National Conference of Social Work in 1951. She is a member also of the panel on Mental Health of the President's Commission on Health Needs of the Nation.

Mr. Glasser was executive director of the Midcentury White House Conference.

Four Health Education Evaluation Studies

Health education programs are more likely to be effective when objective measures are applied as the program is being developed in order to identify likely barriers to success. By discovering such barriers during the early stages of program development, necessary improvements can be made quickly and at minimum cost. These findings are reported in Public Health Monograph No. 8, "Pretesting and Evaluating Health Education."

The studies reported are: "Application of Pretesting in Health Education," by Andie L. Knutson, Ph.D.; "Pretesting a Nutrition Filmstrip," by Benjamin Shimberg, Ph.D.; "Evaluating a Nutrition Education Program," by Benjamin Shimberg, Ph.D., and Jane S. Harris, M.S.; and "Note on Exhibits as a Health Education Medium," by Mayhew Derryberry, Ph.D.

Approach to Pretesting

A systematic approach to pretesting is suggested by calling attention to several conditions necessary for effectiveness which must be satisfied. While satisfaction of these conditions will increase the likelihood of program success, it does not guarantee program success.

A distinction is drawn by Knutson between critical review of the planning process, evaluation studies of program effectiveness, and objective pretests to identify possible barriers to success. A variety of practical approaches are suggested for anyone who wishes to carry out pretests of educational programs or materials.

Nutrition Filmstrip

An application of the principles and methods of pretesting is illustrated in the development of an informational filmstrip about nonfat dry milk. Shimberg emphasizes the techniques and



Public Health MONOGRAPH 8

The accompanying summary covers the principal findings presented in Public Health Monograph No. 8, published concurrently with this issue of *Public Health Reports*. The authors are members of the staff of the Division of Public Health Education, Public Health Service.

Readers wishing the data in full may purchase copies of the monograph from the Superintendent of Documents, United States Government Printing Office, Washington 25, D. C. A limited number of free copies are available to official agencies and others directly concerned on specific request to the Public Inquiries Branch of the Public Health Service. Copies will be found also in the libraries of professional schools and the major universities, and in selected public libraries.

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Knutson, Andie L., Shimberg, Benjamin, Harris, Jane S., and Derryberry, Mayhew: Pretesting and evaluating health education. Public Health Monograph No. 8 (Public Health Service Publication No. 212). U. S. Government Printing Office, Washington, 1952. Price 20 cents.

methodology selected to meet the specific problems posed by this filmstrip.

The behavioral pattern depicted in the film was checked to see whether it conformed with the pattern of living of the intended audience.

Tests to reduce reading difficulty and increase human interest were utilized. Personal interviews of a sample of the intended audience revealed where misunderstandings of the text and illustrations could be eliminated. A test copy of the final filmstrip determined its effectiveness in imparting information about nonfat dry milk to women attending a clinic.

Nutrition Education Program

Evaluation of a health education program in terms of behavior is described in a third paper by Shimberg and Harris. A follow-up study of an educational program about nonfat dry milk was carried out 2 months after the program was presented in a well-baby clinic. Answers to the following questions were obtained: Was the family milk consumption increased? Did the people begin using nonfat dry milk after this program? Did women acquire the information which the program attempted to teach? What attitudes did they have toward nonfat dry milk after the program?

Exhibits

A fourth paper by Derryberry considers these questions: How long will people look at a health exhibit? How much material can be included in an exhibit with some assurance that it will be read?

During the New York World's Fair, trained observers recorded the number of seconds visitors actually spent looking at each exhibit in the Hall of Medicine. Other observers read all the legends of each exhibit and recorded the length of time required to read them. Comparison of these two time-records revealed that as the length of time to read an exhibit increased, the relative amount of time spent on an exhibit decreased.

The findings suggest to exhibitors the need to limit the information they try to cover in an exhibit, if they expect the audience to read the message.

The first two papers in the series, which is continued in the monograph, were published in *Public Health Reports* last year, one in January and one in July.

Sources of Morbidity Statistics

Where do morbidity data come from? What are the gaps?—and what steps should be taken to fill them?

The Third Report of the WHO Expert Committee on Health Statistics presents, among other things, a panoramic review of morbidity statistics sources. Some 24 sources of morbidity data are classified by uses—disease control, program planning, research, etc.; by coverage in terms of population—whether all persons are included, a representative sample, or various types of non-representative samples; by the degree of coverage—whether all or only selected sicknesses are included, and whether disease is reported at a point in time or for a period of time; and by the type of country in which each source is applicable.

The committee recommended study of the sickness survey method as a means of obtaining morbidity data for the general population for health needs. It called for intensive study of means to determine the extent of illness in the general population from data covering selected or specialized populations. Each of the sources of such data—for example, hospital records—is a potential reservoir of public health statistics. The problem is to utilize existing data to obtain a picture of illness in the general population.

The committee made a series of recommendations—covering studies of methods for obtaining data, morbidity terms to be defined, methods of classifying and presenting morbidity data, computing morbidity rates, etc.—to serve as guideposts

for future study and possible action. One of its major recommendations was that “national agencies responsible for health or health statistics establish groups of experts in sampling theory, in the operation of field surveys, and in the analysis of morbidity data within their organization which can utilize survey methods in the investigation of the varied health problems with which such agencies are confronted and make the services of these experts available for consultation throughout the nation and for international purposes.”

Copies of the report may be obtained on request to the National Office of Vital Statistics, Public Health Service, Federal Security Agency, Washington 25, D. C.

Antimalarial Activity of 4,000 Compounds

More than 4,000 compounds were tested at the National Institutes of Health from 1941 to 1951 for antimalarial activity against *Plasmodium gallinaceum* and for toxicity to the chick. These and related data appear in Public Health Monograph No. 9, "A Survey of Antimalarial Compounds."

The report includes a detailed description of the tests employed for antimalarial activity, both suppressive and prophylactic, and the tests for subacute chronic toxicity to the chick. The compounds tested are arranged in chapters according to their presumably important chemical structure. Every chapter contains a series of tables, each of which summarizes the data on compounds in which usually only one part of the molecule has been varied. For each compound the results of the following tests are given: minimum effective therapeutic dose, minimum partially prophylactic and/or completely prophylactic dose, maximum and fully tolerated doses, and the therapeutic index. The salient points in the comparative data in the tables are brought out in the discussion portion of each chapter and an attempt is made to derive general conclusions and principles regarding chemical structure and biological activity.

Summary tables list compounds in order of their minimum effective therapeutic dose, therapeutic index, and prophylactic activity.

Appendixes list the more commonly employed salts of the compounds tested, the sources of the compounds, and a bibliography of publications by the authors and their colleagues dealing with compounds discussed in the monograph. The report is indexed by compound number, based on the numbers assigned by the Office of Scientific Research and Development, under which practically all antimalarial testing was carried on during World War II, and extended to include compounds received at the National Institutes of Health after the war. The index contains cross references to tables in which the compounds can be found, to publications in the bibliography, and to sources.



Public Health MONOGRAPH 9

The accompanying summary covers the principal findings presented in in Public Health Monograph No. 9, published concurrently with this issue of *Public Health Reports*. The authors are members of the staffs of the Laboratory of Tropical Diseases, National Microbiological Institute, and the Laboratory of Chemistry, National Institute of Arthritis and Metabolic Diseases, National Institutes of Health of the Public Health Service.

Readers wishing the data in full may purchase copies of the monograph from the Superintendent of Documents, United States Government Printing Office, Washington 25, D. C. A limited number of free copies are available to official agencies and others directly concerned on specific request to the Public Inquiries Branch of the Public Health Service. Copies will be found also in the libraries of professional schools and the major universities, and in selected public libraries.

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Radiation Exposure in the United States

By DADE W. MOELLER, M.S., JAMES G. TERRILL, JR., C.E., M.B.,
and SAMUEL C. INGRAHAM, II, M.D., M.P.H.

THE HUMAN RACE has always been exposed to some ionizing radiation of cosmic origin and from natural sources in the environment and within the body. During a lifetime, a person who lives to be 70 years of age is exposed, on the average, to about 9 roentgens of radiation from these sources. Today, however, radiation from these sources comprises only a small portion of the total exposure received by man. Radiation-generating machines and radioactive materials, which are being employed in nearly all phases of the environment, constitute the principal sources of radiation.

Knowledge of the wide variety of sources and of the levels of radiation exposure is essential to the planning and conducting of a sound radiological public health program. Data available in the literature on the extent of radiation exposures in the United States are reviewed here to aid the many State and local health departments engaged in determining and evaluating radiation sources affecting public health in their areas. Neither the control of radiation exposure nor specific public health effects of the exposure are discussed in this paper.

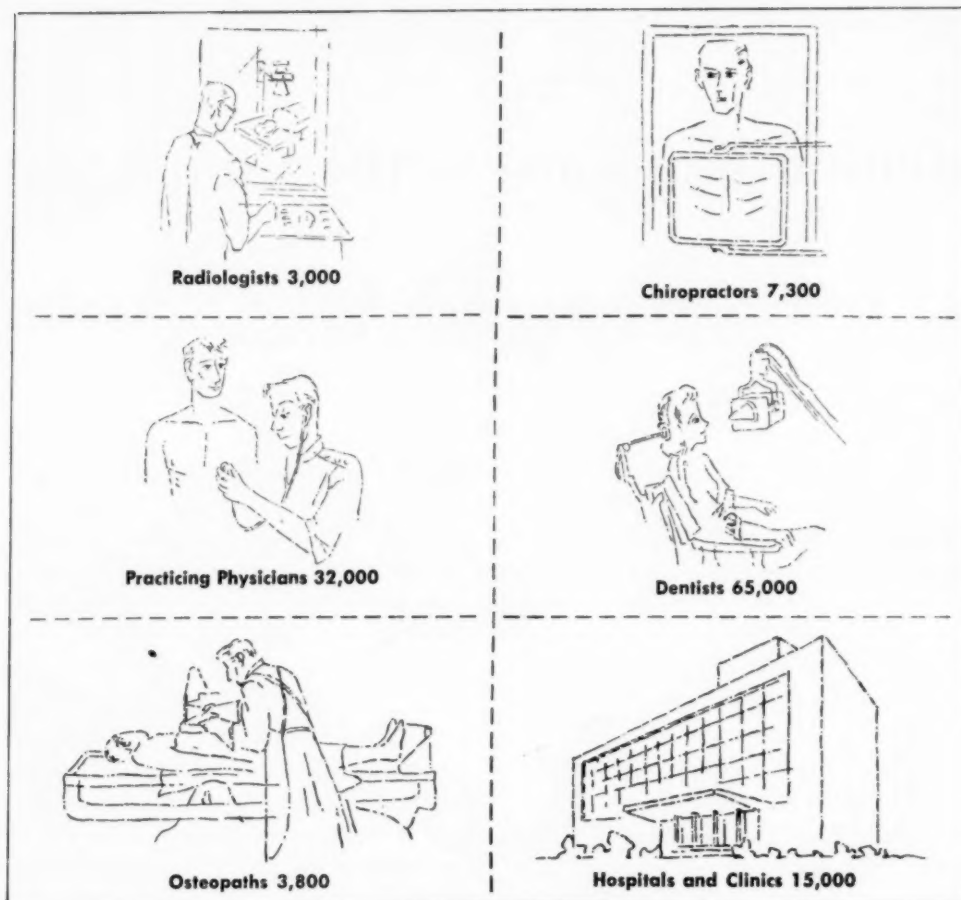
Mr. Moeller, a sanitary engineer, is an environmental radiation specialist with the radiological health branch, Division of Engineering Resources, Bureau of State Services, Public Health Service. Mr. Terrill is acting chief of the branch and chairman of the Committee on Radiological Health of the Engineering Section, American Public Health Association. Dr. Ingraham is assistant chief of the branch.

Medical and Dental Uses of X-ray

In the United States today, more than 125,000 X-ray units are being used for diagnosis and therapy—approximately 50,000 by general practitioners, physician specialists, radiologists, and in hospitals and clinics (1); 65,000 by dentists; and 11,000 by doctors of osteopathy and doctors of chiropractic.

In the operation of these X-ray units, more than 215,000 medical-technical personnel are potentially exposed to radiation. These personnel include about 3,000 radiologists devoting full time to their specialty, 500 physicians devoting most of their time to radiology, 600 physicians who are second- and third-year residents in radiology, 31,000 general practitioners and specialists owning their own equipment (1), 67,000 dentists, 11,000 osteopaths and chiropractors, 40,000 X-ray technicians, and probably close to 40,000 dental technicians and assistants. This listing undoubtedly omits many nurses, clerks, attendants, and technicians who are exposed to radiation in a lesser degree.

Although many instances of excessive exposure of X-ray personnel are reported in the literature, few specific data are available regarding average exposure for these workers. In a 3-week survey of personnel in doctors' and dentists' offices and X-ray departments, it was found that about 3 percent of the exposures exceeded the present-day maximum permissible dose of 0.3 roentgen per week. However, 81.5 percent were less than 0.05 roentgen per week (2). In a 9-month survey of personnel in X-ray departments only, about 0.4 percent of the exposures exceeded 0.3 roentgen per week,



X-ray units in the healing arts

with 97 percent being less than 0.05 roentgen per week (2).

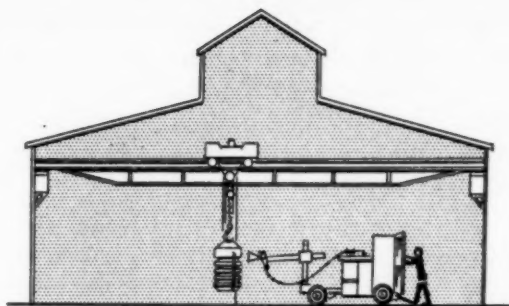
Exposures of X-ray personnel in Public Health Service hospitals range from 0 to 0.46 roentgen per 2-week period. An appreciable fraction of radiologists experience exposures averaging more than 0.1 roentgen per day. About 20 percent of the personnel operating photofluorographic equipment exceeded 0.3 roentgen per week prior to the start of a successful radiation control program.

Operators of dental X-ray machines receive approximately 0.1 roentgen of general body exposure per eight mouth examinations, each of which consists of ten 3-second exposures. This figure assumes careful operation of the unit. In conducting mass dental X-ray surveys, operators can easily receive the maximum permissible dose of radiation even with some rotation of operators. Persons in the immedi-

ate area of dental X-ray units can receive appreciable percentages of the maximum permissible dose.

In addition to the operators, a considerable portion of the general population is also exposed to radiations from X-ray machines. Of the 2,500,000 persons seen daily by physicians, a large number have some X-ray diagnostic procedure performed upon them by the physicians, and 82,000 are referred to radiologists. Approximately 25,000,000 X-ray examinations are given annually by radiologists (1). Data relative to radiation exposures resulting from these examinations are summarized below:

Type of examination	Average radiation dosage (roentgens)	Distribution (percent)
Radiographic.....	2.7	51.88
Photofluorographic.....	1.0	33.64
Fluoroscopic.....	65.0	14.48



Industrial X-ray installation

The radiation exposures range from approximately 1 roentgen for a photofluorographic examination to about 65 roentgens for an average fluoroscopic examination. Using the data in the above table and weighting each radiation dosage by its percentage distribution, an overall average radiation dose can be calculated. This average dose is 11 roentgens per examination.

X-ray treatments given annually by radiologists number more than 4,000,000 (1). These treatments are usually confined to a very small portion of the patient's body, and are usually administered at several sittings. The average total dosage per patient is about 5,000 to 7,000 roentgens.

Probably the largest single source of medical radiation exposure in the United States is the mass chest X-ray survey for tuberculosis. An estimated 15,000,000 persons were given chest X-rays in such surveys in 1950. Most of the X-rays given in the mass survey are the photofluorographic type, which results in about 1.0 roentgen exposure to the patient's chest per examination.

Some 84,000,000 films are used annually for dental X-ray examinations. In 1949, the 60 million persons (40 percent of the population) who visited their dentists were potentially exposed to radiation from this source. The average exposure to the patient per film is about 5 roentgens, most of the exposure being limited to the mouth of the patient.

X-ray in Industry

Industrial X-ray devices include primarily (a) radiographic and fluoroscopic units used for the determination of defects in castings, fabricated structures, and welds, and (b) fluo-

roscopic units used for the detection of foreign material in, for example, packaged foods. At present, there are approximately 800 industrial radiographic installations in the United States (3), and about 5,000 persons are potentially exposed to radiation in the use of the equipment. Industrial X-ray units, both radiographic and fluoroscopic, probably number about 2,000.

Exposure levels for personnel operating these machines depend upon the type of installation and the operating procedures used. Most permanent installations were designed and the personnel assignments planned so as to limit exposures to the levels recommended by the National Committee on Radiation Protection at the time the installation was built. However, the downward revision of the maximum permissible dose calls for a reevaluation of the older installations.

Fluoroscopy is also sometimes used for the scanning of personnel to detect pilfering. Exposures of 0.045 to 0.09 roentgen per inspection may be received by the "subject." The unit operator may receive 0.1 roentgen, largely limited to his head and shoulders, for each 50 persons inspected (4).

Other potential sources of X-ray exposure in industry are found in connection with the manufacture, testing, and operation of high-voltage electronic tubes. Personnel exposures may range as high as 2.5 roentgens per day.

Commercial Use of X-ray

The use of fluoroscopy in shoe-fitting results in radiation exposures to both operators of the fluoroscopes and the public. Mean exposures for the customer range from 7 to 14 roentgens per 20-second exposure. Although the radiation is intended only for the feet, dosages of 0.03 to 0.17 roentgen per 20-second exposure may be received by the pelvis. The number of exposures received by shoe customers is not known. In the operation of the approximately 10,000 fluoroscopes in the United States, 30,000 to 40,000 sales people are exposed to radiation.

X-ray in Research

With the development of atomic and nuclear physics, high-voltage X-ray machines have be-

come familiar features of research laboratories in universities and similar institutions. Few data are available as to the levels of exposure received by personnel in these radiation laboratories. Injuries have probably been held to a minimum by frequent turnover of personnel. However, in laboratories where cyclotrons, linear accelerators, and positive ion tubes, as well as high-voltage X-ray machines, are used, it is estimated that there is a frequency rate of "one palpable injury per 20 to 30 man-years of active employment in radiation work" (5).

Also in use for research purposes are about 1,500 X-ray diffraction units. Surveys of these units by the radiological health branch of the Public Health Service have recorded intensities of scattered radiation up to 1 roentgen per hour. Several cases of skin ulcers resulting from accidental overexposures in the use of these units have been reported.

Another X-ray unit found in many laboratories is the electron microscope. Approximately 500 are in use. Intensities of scattered radiation from these units may range up to 1.5 roentgens per hour.

Radioisotopes Distributed by AEC

More than 900 universities, hospitals, and research laboratories in 46 States have used or are using radioisotopes produced by the Atomic Energy Commission for medical, biological, industrial, agricultural, and scientific research, and medical diagnosis and treatment. During 1950 an average of 45 curies of radioactive isotopes were distributed per month. There are currently some 7,500 persons who are directly involved in the use of these materials. About 1 in 300 radioisotope users exceeds the present-day maximum permissible dose in a given week. Fifty to seventy-five percent receive less than 0.05 roentgen per week.

Patients to whom radioisotopes are administered internally may receive up to 10 or more roentgens whole-body exposure from diagnostic doses and 75 to 100 roentgens from therapeutic doses. Calculated dosages to single organs, such as the thyroid gland, range from 10,000 to 300,000 roentgens.

Radioisotopes are also used in medical therapy as external sources of radiation. Beta-ray

applicators are available for the treatment of certain eye conditions. Cobalt-60 is available in the form of large shielded concentrated sources for deep therapy and in the form of small needle sources for intracavitary and interstitial therapy.

Cobalt-60 is used industrially for radiography. About 80 sources are being used in the United States in industries such as railroading, steel production, boiler-making, automobile manufacture, ceramics production, pressure vessel manufacture, and the making of castings. The intensity of radiation from 1 curie of unshielded cobalt-60 at 1-foot distance is 14.4 roentgens per hour. The quantities used in industry range from 100 or 200 millicuries up to as high perhaps as 1 curie.

Thickness gauges using radioisotopes are becoming more and more popular in industry. More than 50 such gauges using strontium-90 and some 20 using other radioisotopes are presently in use in the United States. Surveys have shown that the external radiation to which personnel working around these units are exposed is well below the maximum permissible dose. Strontium-90 is also used to activate phosphors for use in luminous markers, which are hermetically sealed to prevent escape of the radioactive material.

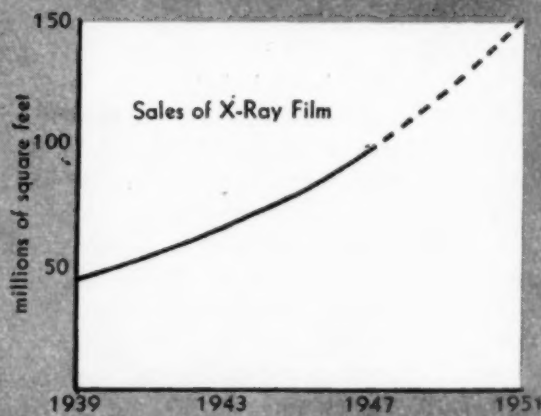
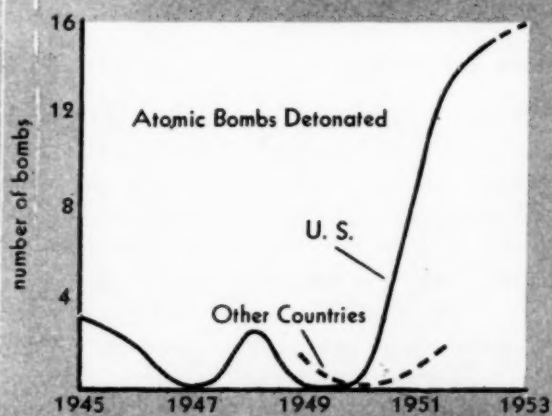
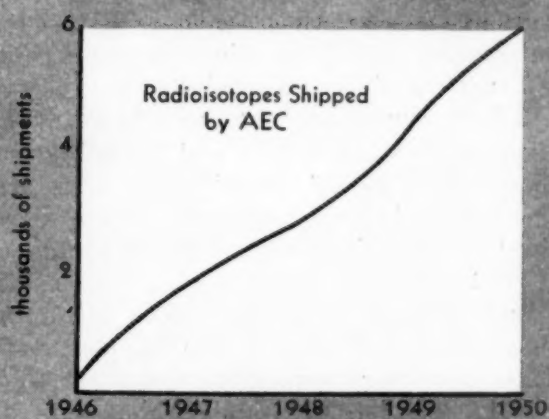
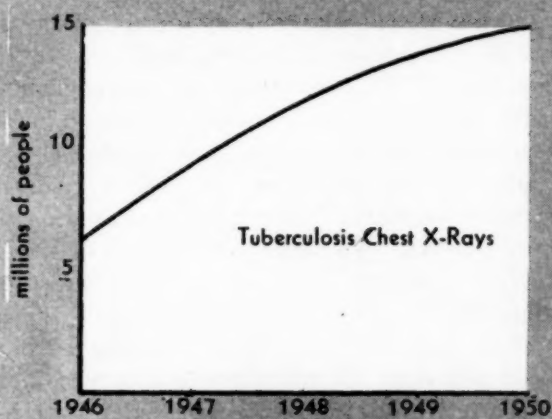
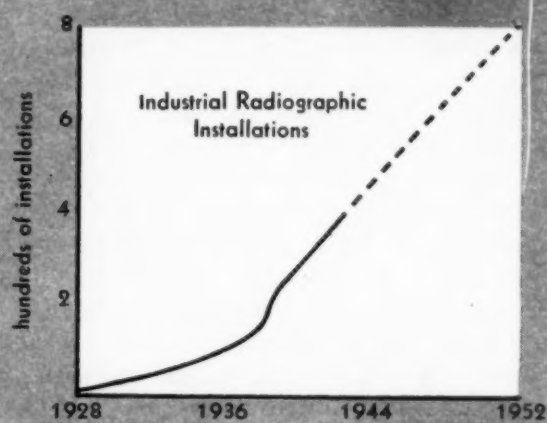
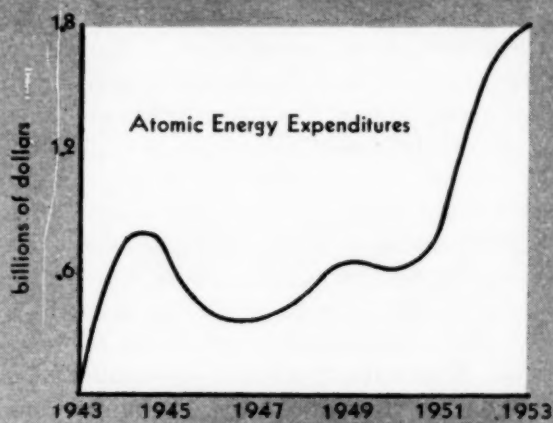
These and other radioisotopes are being widely used in a variety of industrial research problems.

Within the next few years, industrial uses of fission products are expected to become more widespread. Through 1950, however, only about 4 curies had been distributed by the Atomic Energy Commission.

Wastes from the use of radioisotopes in industry, the medical profession, and research laboratories could cause radiation exposure to persons outside the installations using the radioisotopes. Safe disposition procedures are well covered in official publications.

Radium

The radiation from 1 curie of radium, in equilibrium with its decay products and enclosed in 0.5 mm. of platinum will produce a gamma-ray exposure of about 9.0 roentgens per hour at a distance of 1 foot.



INCREASE OF RADIATION

Many individuals are potentially exposed to radiation in the medical use of radium. Patients receive radiation dosages comparable to those given in X-ray treatment. Nurses and other persons attending the patient are also exposed during the course of treatment. Technicians and therapists often receive high exposures since radium can seldom be applied accurately with remote handling devices. Local exposure to their hands often exceeds 1 roentgen per day. In the preparation and handling of radon applicators, these personnel may receive additional radiation exposures.

During World War II, radium was used extensively in the United States for industrial radiography, largely because X-ray units were difficult to obtain. As much as 100 grams were in use. In 1948, the amount had declined to 50 grams (6). At present, many of the radium radiographic installations have been replaced by X-ray machines and cobalt-60.

Radium sources are commercially available in 25-, 50-, 100-, 200-, 300-, and 500-milligram units. The 100- and 200-milligram units are most commonly used. Average exposures received by industrial personnel handling radium are not known.

Another industrial use of radium is in self-luminous paint. During World War II, several thousand workers were using this paint, and several hundred grams of radium were utilized. After the war, the number of workers decreased until in 1948 there were only about 300 (6). Although each worker handles only a small quantity of radium, the hazards are great since the radium is not sealed in a container and can therefore be ingested or inhaled.

Under present conditions, it is recommended (National Bureau of Standards Handbook 47) that the amount of radium-226 fixed in the body should not exceed 0.1 microgram. Fatalities have been known to occur when the amount was approximately 1 microgram. Under the best working conditions existing in 1943 in the radium-dial-painting industry, 15 percent of the workers accumulated more than the maximum permissible amount (7). In a recently reported survey at an instrument shop, a degree of radium contamination greatly in excess of the maximum permissible concentration was found.

It is generally accepted that the maximum permissible concentration for radon in the air is 10 micromicrocuries per liter (5). When workroom ventilation requirements are met, the radon concentration in the workroom air does not exceed 30 percent of the maximum permissible concentration. However, ventilation requirements are not always met, especially in storage and packing rooms and offices.

The normal gamma-radiation exposure received by dial-painting workers appears to be about 0.02 roentgen per day (5). Exposures to radiation may also occur in the use of finished products containing a luminous compound. A watch may have approximately 1 microgram of radium on it. Some clocks and aircraft instruments contain from 10 to 100 micrograms of radium. The level of exposure at the instrument panel in airplanes so equipped may be 0.01 roentgen per hour, and at the pilot's body position from 0.0002 to 0.001 roentgen per hour.

An important factor to be considered in determining radiation exposure in the United States is that radium and many other naturally radioactive materials may be purchased on the open market. No formal application or special facilities are required in order to obtain these materials.

Numerous instances of radium being lost have been reported, all constituting danger of unsuspected radiation exposure. Taft (8) has reported on 107 losses, with 59 complete recoveries, 11 partial recoveries, 36 total losses, and 1 not recorded.

Static Eliminators

Static eliminators containing radioactive sources are widely used in textile and paper trades, printing and photographic processing industries, and by telephone and telegraph companies. They are also used with analytical balances and microtomes.

One type consists of a bar containing a strip of metal impregnated with radium. A thin layer of gold and nickel is plated over the radium metal strip to protect the radium and act as a seal. The main hazards from this type result from exposure to beta and gamma radiation (alpha constitutes little external hazard) and radon gas.

Exposure levels in the working areas near these units are generally about 0.005 roentgen per hour but may range up to 0.085 roentgen per hour. Unless care is exercised and the necessary shields used, maintenance men and other workers whose duties require them to be close to such units frequently can be exposed to radiation levels as high as 1 roentgen per hour.

The radon hazard is small if the units are given proper care and used in ventilated areas. However, if the seal is broken, a radon hazard may result. Several surveys have pointed out that improper storage and handling of static eliminators is common.

A second type of static eliminator contains polonium as the radioactive source. This unit constitutes little external radiation hazard since the alpha particles from polonium travel only a short distance in air. The hazards associated with its use result from ingesting, absorbing, or inhaling polonium liberated through breaking or flaking of the gold seal.

Small polonium bars are also mounted on brushes as static charge eliminators for phonograph records and photographic films.

A point about polonium that must be given careful consideration in certain applications is that polonium volatilizes at lower temperatures than radium.

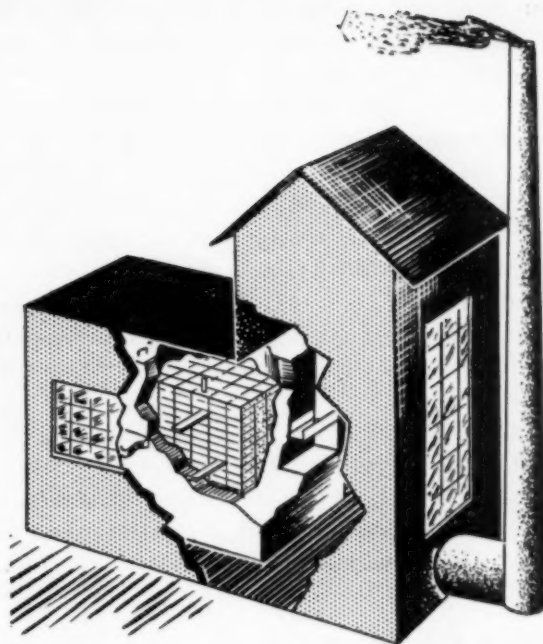
Shipping of Radioactive Materials

Radiation exposures can occur during the handling and shipping of radioactive materials. Under the current regulations governing the shipment of these materials by air, the maximum exposure which an airplane crew member or passenger could receive would be 0.012 roentgen per hour. The maximum exposure for pilots (flying 85 hours per month) would therefore be 1.02 roentgens per month (9).

Nuclear Reactors

Radiation exposures associated with the operation of nuclear reactors include those from the reactor itself, from its ventilation and cooling effluents, and from its fission products.

Data on the "water boiler" type reactor being built at the North Carolina State College serves as a tentative guide in establishing the



Enriched-uranium, graphite-moderated reactor

importance of such installations as sources of radiation exposure (10).

A maximum of some 10^5 curies of activity will be present in the fuel solution of this reactor. Heavy shielding will be required to limit all radiation exposure from the reactor and its accessories to a safe level.

At maximum operating level, 10 kilowatts, the reactor will require 3 gallons of water per minute for cooling. Upon leaving the reactor, the water will contain some 1,000 disintegrations per second per cubic centimeter. Assuming no shielding and no internal absorption of radiation by the water, 10 gallons of freshly irradiated water would produce a radiation dosage rate of approximately 0.08 roentgen per 8 hours at a distance of 5 feet. After 1 hour, the dosage rate would drop to about 0.0008 roentgen per 8 hours at a distance of 5 feet. Tanks for collecting and retaining this waste water for 10 hours will be provided.

Some 40 liters per hour of waste gases will be produced at 5 kilowatts normal operating level. The activity of these gases will amount initially to about 7,000 curies per kilowatt minute. After 4 hours, however, this 7,000 curies will have decayed to 0.15 curie.

Solid as well as other liquid and gaseous wastes will result if laboratory or experimental

programs are conducted in conjunction with operation of the reactor, or if the used nuclear fuels are reprocessed.

A second type of nuclear reactor, an enriched-uranium, graphite-moderated reactor, is being built for industrial research. It will be operated at a maximum power level of 200 kilowatts. Shielding, weighing a total of 450 tons, will be provided by 6 inches of steel and about 3 feet of "heavy" concrete. Data as to the wastes from operation of this reactor and the possible resulting radiation exposures have not been released.

Undoubtedly, other reactors will soon be built at other colleges and universities and in industry. At least five major universities have expressed interest in following the steps of North Carolina State College.

Particle Accelerators

In 1941, there were only some 16 cyclotron laboratories in the United States. Today, however, more than 100 particle accelerator units, including cyclotrons, synchrotrons, van de Graaff generators, and betatrons, are in use.

Exact determination of the type and intensity of radiation encountered around particle accelerators is often difficult and sometimes impossible because of the mixture of radiations present. Beta radiation originates from the various accelerators, but the possibility of direct exposure is slight. Neutrons probably constitute one of the main hazards, as they are produced in profusion in the operation of cyclotrons and synchrotrons.

Impaired vision of several nuclear physicists as a result of work with cyclotrons was reported

recently. The general injury rate for laboratory radiation workers was discussed above under X-ray in Research.

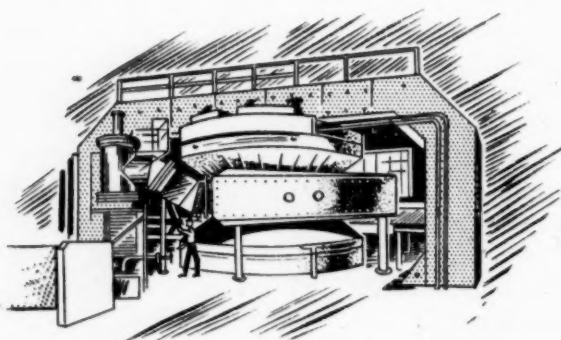
AEC Activities

Activities sponsored by the Atomic Energy Commission which result in radiation exposure include uranium mining and milling, nuclear reactor operations, and testing of weapons.

Uranium mining and milling in this country is carried on primarily in the region of the Colorado Plateau. Some 2,000 miners and millers are engaged in this work. The mining and processing of the ores and metals yields dusts and fumes which are sources of radioactive air pollutants. Radon gas is also a hazard. The Public Health Service and several State health agencies, which are active in studies of the specific hazards in this industry, have reported finding radon exposures above the maximum permissible concentration in several of the mines. In these instances, control measures, particularly ventilation, are being applied as rapidly as possible. Detailed physical examinations of over 1,100 workers have revealed no evidence of health damage from radioactivity.

Atomic Energy Commission installations conducting nuclear reactor operations are located in many areas of the United States. The radius of the potential health hazards of these operations may be increased by the discharge of radioactive liquid and gaseous wastes. For example, the installation at Oak Ridge, Tenn., discharges up to 5 curies per day of liquid wastes to the White Oak Creek. The potential risks are by no means always confined to those directly associated with such activities. For these reasons, an effective radiation control program has been an integral part of atomic energy operations since their inception.

In 1951, 12 bombs were detonated at the AEC Proving Ground in Nevada. The activity 1 hour after detonation of a nominal atomic bomb is approximately 10^9 curies. One week later, about 10^7 curies remain. Fortunately the majority of this radiation probably remains in the upper atmosphere, but some of it is widely distributed causing a temporary average increase in radioactivity throughout the United States.



The 184-inch Berkeley synchrocyclotron

Accidents

Numerous instances of radiation injury from accidents have been recorded in the literature. Moreover, it is believed that these represent only a small fraction of the accidents which occur. Any radiation exposure resulting from accidents would be in addition to the exposures discussed here. Obviously, the potential amount of exposure and the probable severity of injury incurred in an accident would vary with the amount of radiation involved.

Summary and Conclusions

A review of the literature reveals that the average annual radiation exposure from medical diagnostic procedures is about 2 roentgens per person. This exposure is received by a large portion of the population. Other medical sources of exposure are dental X-rays and medical radiation treatments.

Many segments of the population receive additional exposures as a result of contact with radioactive materials and radiation-generating units in commerce, industry, and research.

From the data presented, it is not possible to reach definitive conclusions as to the magnitude of the radiological health problem or as to the relative importance to public health of the several sources of ionizing radiation. It is hoped, however, that publication of this paper will encourage further studies which will lead to more conclusive data.

This review, meanwhile, indicates that large numbers of the population are currently exposed to radiation appreciably in excess of natural background. Such exposure often approaches doses recommended as the maximum permissible for radiation workers. The sources of these exposures vary from community to community, and their relative health importance is continually changing.

A tremendous national effort is being made by military and civilian agencies to expand the production and use of radioactive materials. It is expected that the near future will bring nuclear reactors for power production, research, and transportation into widespread use. Many radiological health workers believe that as this technological development occurs pro-

tection from radiation must become a major concern of public health programs. The time to organize and train to meet the radiological health responsibility of the future is at hand. The ability of health workers to cope with public health problems arising from the increasing hazard of ionizing radiation will be more readily developed if they learn to search out and to deal with the radiological health problems of today.

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Chemical Labeling Committee Reactivated

THE INTRODUCTION within recent years of a multitude of new chemicals and the increasing commercial application of chemical products have intensified the need for proper precautionary labeling. The use of adequate warning designations on containers of chemical products is essential in protecting the health of not only those who handle these materials in their various repackaging and processing stages but also of the ultimate consumers.

To reappraise current needs and to take new steps to meet today's problems, the Public Health Service is reactivating the work of the Chemical Products Agreements Committee, which had functioned prior to 1950. The new committee, to be known as the Chemical Products Labeling Committee, will serve in an advisory capacity to the Labels and Precautionary Information Committee of the Manufacturing Chemists' Association and to other agencies, such as State health and labor departments. The Public Health Service will provide a focal point in the Federal Security Agency for obtaining expert opinion on the need for labeling as well as for developing base lines for uniform labeling practices.

In recent years, practically every State health department and many labor departments have become interested in the labeling of toxic materials, and the resultant development of varying labeling requirements throughout the country has made it difficult for industry to cooperate.

In the interest of promoting uniform labeling, an effort will be made by the Chemical Products Labeling Committee to unite the activities of the various groups interested in this problem, to encourage better labeling practices throughout industry, and to assist in the development of improved labels.

The forerunner of this committee, in cooperation with the Manufacturing Chemists' Association, had been concerned with the develop-

ment and administration of specific agreements between the Surgeon General and certain chemical manufacturers, covering warning designations to be used on containers. Drawn up in the early 1930's, these agreements with manufacturers of methanol, carbon tetrachloride and other chlorinated hydrocarbons, carbon disulfide, aniline, benzene, and chlorinated naphthalenes, diphenyls, and diphenyl oxides were self-limiting because they were designed for specific conditions. These agreements have now been discontinued by the Public Health Service as part of its efforts to foster broader labeling practices better adapted to present conditions.

The products specified in the agreements that have now been abrogated, as well as all other potentially hazardous chemicals, are covered by a label pattern developed by the Labels and Precautionary Information Committee of the Manufacturing Chemists' Association, with the concurrence of the Public Health Service. Such a pattern is believed to afford a more feasible approach to the problem presented by the tremendous expansion of the chemical industry.

Surgeon General Leonard A. Scheele, commending the work of the Labels and Precautionary Information Committee, indicated that the Public Health Service endorses the principles of labeling as set forth in part I of Manual L-1, Warning Labels, published by the Manufacturing Chemists' Association. He stressed that the identification of potentially hazardous materials through proper and uniform labels is vital to the public health.

This labeling program has been developed for bulk packages of chemicals intended for commercial use and in no way affects the provisions of the Federal Caustic Poison Act, which applies to some caustic and corrosive chemicals intended for household use, or of the Federal Food, Drug, and Cosmetic Act, which requires adequate warnings on the labels of all drugs.

Members appointed by the Surgeon General to the Chemical Products Labeling Committee represent a cross section of Public Health Service activities related to this problem. Joseph E. Flanagan, Jr., assistant chief, Division of Occupational Health, will serve as chairman of the committee; members will be Dr. Samuel W. Simmons, chief of the technical development branch, Communicable Disease Center; Frederick S. Kent, chief of the home

accident prevention unit, Division of Sanitation; Dr. Donald J. Birmingham, chief of the clinical investigations section and of the dermatology unit, Division of Occupational Health; Dr. Herbert E. Stokinger, chief toxicologist, Division of Occupational Health. The Manufacturing Chemists' Association has appointed as a representative on this committee the chairman of its Labels and Precautionary Information Committee.

Diphtheria in the United States

The incidence of diphtheria in the United States has shown a steady decline during the past few decades. From a 3-year average rate of 60.3 cases per 100,000 population for 1929-31, the rate dropped to an average of 3.9 for the period of 1949-51. It is estimated by the National Office of Vital Statistics that 3,200 cases of diphtheria will be reported in 1952, which would be a morbidity rate of about 2 cases per 100,000 population for the year.

During the last 2 decades decreases have occurred in diphtheria incidence rates for each of the geographic divisions, but these decreases, as shown in the chart, have

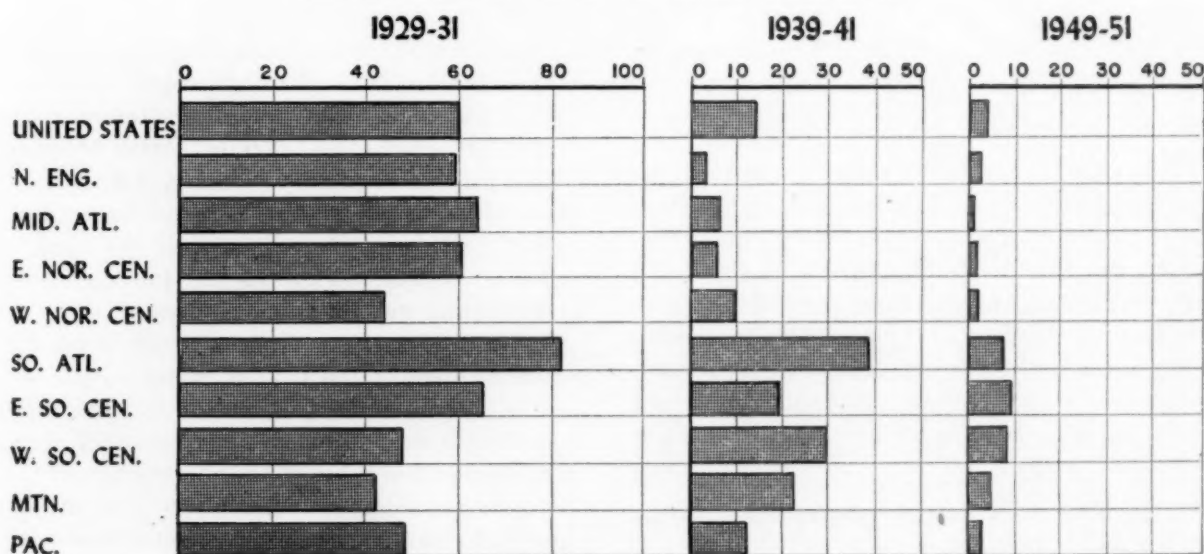
not been of the same magnitude in each division. The highest rate (82.8) in 1929-31 was in the South Atlantic division. In 1949-51 the high incidence has shifted farther south and the rate of 8.9 in the East South Central division was the highest. On the basis of data available in November 1952, it is estimated that the rates in 1952 in the various geographic regions will be approximately as follows: New England 0.5 cases per 100,000 population, Middle Atlantic 0.9, East North Central 0.7, West North Central 1.4, South Atlantic 4.3, East South Central 5.6, West South Central 4.1, Mountain 1.6, and

Pacific 1.3. In each instance this represents a substantial decrease as compared with average rates for the 1949-51 period.

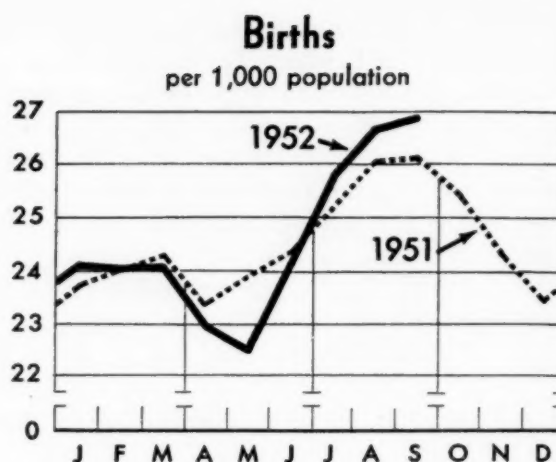
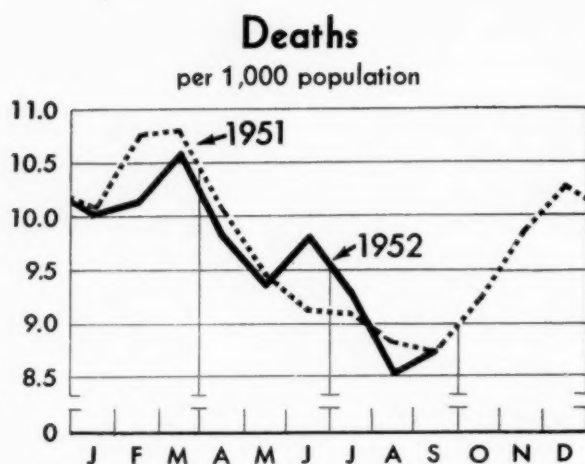
Comparison of the percentage of the total cases occurring in the various areas also shows the shift in incidence from northern to southern States. For the period 1929-31, 34 percent of the cases in the United States were reported in the three southern divisions; Middle Atlantic, East South Central, and West South Central. During 1949-51, 64 percent occurred in these areas and in 1952 the proportion is still greater, namely 68 percent.

DIPHTHERIA BY GEOGRAPHIC DIVISIONS

(AVERAGE MORBIDITY RATES PER 100,000 POPULATION)



Estimated population July 1, 1930, 1940, and 1950.



United States Vital Statistics, 1951-1952

A new high for births and a continuing low level for deaths appear very likely for 1952 (table 1). Thus the natural increase in the population of the United States—that is, births minus deaths—should be greater than for any previous year. Marriages in 1952 continued to drop from the all-time high reached in 1946. On the basis of data from 19 States, divorces, which have also dropped off since their 1946 peak, appear to be rising slightly in 1952. These statements are based on provisional figures for States shown in the *Monthly Vital Statistics Report* for January-September 1952. Each month the figures are sent by State and local officials to the National Office of Vital Statistics.

Deaths

Mortality statistics for the United States show that for the last 4 years, 1948-51, less than 10 people out of every 1,000 died during the year. For the first 9 months of 1952 the death rate was 9.6 deaths per 1,000 population, indicating that 1952 is likely to rank along with 1950 in having the lowest death rate on record.

For the past 15 years, 1937-51, the infant mortality rate (deaths under 1 year of age per

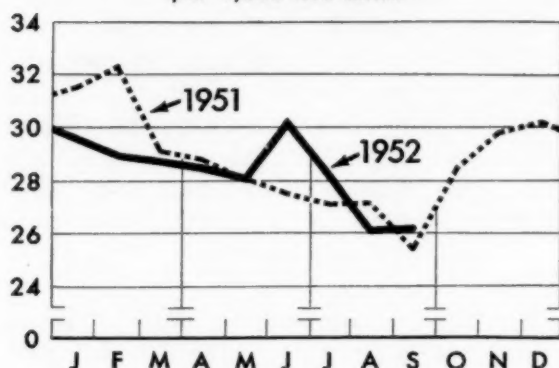
1,000 live births adjusted for changing numbers of births) for each year has been lower than that for the preceding year. For the period January-September 1952, the infant mortality rate was 28.3, so that 1952 may prove to be no exception to this trend of ever lower annual rates.

The summer of 1952 was noteworthy for long spells of record-breaking hot days in many parts of the country. That the heat wave had some effect on mortality is evident in two of the accompanying charts. Generally, in its seasonal variation the death rate decreases from May to June. Last year the death rate swung upward from 9.4 deaths per 1,000 population for May to 9.8 for June, the highest rate for June since 1944. The infant mortality rate rose from 28.2 infant deaths per 1,000 live births for May to 30.2 for June, contrary to its usual downward seasonal swing. Unusual increases were noted in the death rates for diseases of the cardiovascular system, for accidents, for homicide, and for some gastrointestinal diseases.

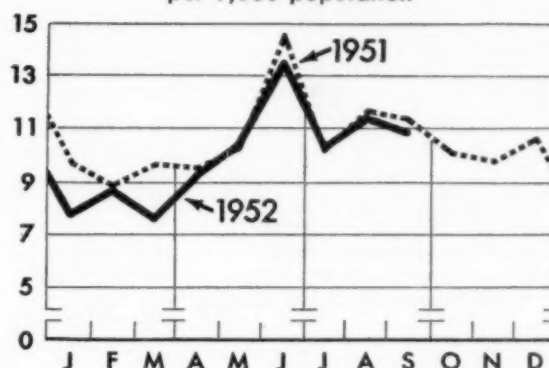
Table 2 gives the estimated death rates for selected causes in the United States during the first 9 months of 1951 and of 1952. The relative timeliness of information on causes of death is made possible through the cooperation of the States in sampling their death records monthly. The State vital statistics offices send to the national office every tenth death certificate, which

Prepared by the National Office of Vital Statistics, Public Health Service.

Infant mortality per 1,000 live births



Marriage licenses per 1,000 population



is processed immediately. However, this early information is less accurate than the complete data that will be available when all the death certificates are received. A discussion of the amount of error to be expected as a result of sampling variation is presented in the *Monthly Vital Statistics Report*.

Births

In 1951 and the first 9 months of 1952 the number of births exceeded records set in 1947. For January–September it is estimated that 2,856,000 births were registered in 1952 as compared with 2,811,000 in 1951 (table 1). The number recorded during all of 1951 (3,758,000) was in turn almost 2 percent above the 1947 figure of 3,699,940 (final). In the years between these high points, the annual number of registered births held consistently at 3½ million.

The total number of births is slightly larger than the number registered because of the failure to register some births. It is estimated that 3,833,000 children were born in 1951 as compared with 3,817,000 in 1947.

The crude birth rate serves to indicate what proportion births bear to the current population of all ages. In a period of rapidly increasing population, as at present, this proportion may decline despite a rise in the number of births. Thus, the crude birth rate based on registered births was 24.5 per 1,000 population in 1951 and 25.8 in 1947. Between 1950 and 1951, a period in which the number of births rose sharply, the rate also increased (from 23.5 to 24.5). The slightly higher number of births in the first 9 months of 1952 as compared with 1951 caused no change in the birth rate, which was 24.6 for both periods.

Table 1. Vital statistics: United States, January–September, 1951 and 1952

	Number			Rate		
	1952	1951	Percent change	1952	1951	Percent change
Live births:						
Registered.....	2, 856, 000	2, 811, 000	+1. 6	24. 6	24. 6	0
Corrected for under-registration.....	2, 905, 000	2, 867, 000	+1. 3	25. 0	25. 1	–0. 4
Marriage licenses.....	1, 161, 840	1, 223, 951	–5. 1	10. 0	10. 7	–6. 5
Deaths.....	1, 114, 000	1, 106, 000	+0. 7	9. 6	9. 7	–1. 0
Infant deaths.....	80, 500	79, 400	+1. 4	28. 3	28. 6	–1. 0

NOTE: Deaths exclusive of fetal deaths and of deaths among armed forces overseas. Birth, death, and infant death data estimated. Birth, death, and marriage license rates per 1,000 population excluding armed forces overseas; infant mortality rates per 1,000 live births and adjusted for changing numbers of births. All rates on an annual basis. Population estimates prepared by the Bureau of the Census.

The recent upsurge in births began early in 1951 with peak increases over 1950 occurring in the months March through June. In the latter half of 1951, the birth rate each month exceeded that for the corresponding month of 1950, but by a smaller margin. The chart com-

Table 2. Estimated death rates for selected causes of death: United States, January–September, 1951 and 1952

[Exclusive of fetal deaths and of deaths among armed forces overseas; rates on an annual basis per 100,000 estimated population, excluding armed forces overseas]

Cause of death	Death rate, January– September	
	1952	1951
All causes.....	958.9	966.6
Tuberculosis, all forms.....	17.3	20.3
Syphilis and its sequelae.....	3.7	4.6
Dysentery, all forms.....	.6	.7
Diphtheria.....	.1	.2
Whooping cough.....	.3	.7
Meningococcal infections.....	1.0	.7
Acute poliomyelitis.....	1.9	.7
Measles.....	.4	.7
All other infective and parasitic diseases.....	3.3	2.9
Malignant neoplasms, etc. (principally cancer).....	142.7	141.6
Diabetes mellitus.....	16.2	16.4
Major cardiovascular-renal diseases.....	507.5	511.7
Diseases of cardiovascular system.....	493.8	496.3
Vascular lesions of central nervous system.....	108.5	104.6
Rheumatic fever.....	1.0	1.1
Diseases of heart.....	350.6	355.5
Hypertension without mention of heart and general arteriosclerosis.....	28.3	30.2
Other diseases of circulatory system.....	5.4	4.8
Chronic nephritis, etc.....	13.7	15.4
Influenza and pneumonia, etc.....	31.3	32.7
Ulcer of stomach and duodenum.....	5.6	5.4
Gastritis, duodenitis, enteritis, etc.....	5.4	5.1
Cirrhosis of liver.....	9.8	10.0
Acute nephritis, etc.....	1.8	2.1
Complications of pregnancy, etc.....	1.6	1.8
Congenital malformations.....	12.1	11.8
Senility, etc., and ill-defined conditions.....	15.2	16.7
Motor-vehicle accidents.....	22.2	21.1
All other accidents.....	38.9	38.9
Suicide.....	10.0	10.5
Homicide.....	4.8	4.5
All other causes.....	105.0	104.5

NOTE: Figures are based on a 10-percent sample of death certificates. The sampling error varies with the size of the death rate. For example, the estimate for diseases of heart is subject to an error of 0.5 percent, and for syphilis, 4 percent. Diphtheria, with a rate of only 0.2, is subject to an error of 22 percent.

paring monthly rates for 1951 and 1952 through September indicates that the main increases in 1952 occurred in July through September.

Part of the over-all increase in births in 1951 and 1952 was undoubtedly due to greater numbers of first-order births resulting from the sharp rise in marriages soon after the outbreak of hostilities in Korea. However, it is likely that increased numbers of higher-order births in these years also contributed to the gain.

Marriages

Monthly marriage license rates for the United States in 1951 and in 1952 through September (fourth chart) reveal a fairly similar seasonal pattern. Fewer marriage licenses are issued during the winter months than in the spring and summer, and June is the most popular month for obtaining marriage licenses.

In the past, marriage licenses have been responsive to such factors as the demobilization following the last war, the outbreak of hostilities in Korea, and the varying dates of Easter. The low birth rates during the business depression of the early 1930's, with the consequent reduction in numbers of young persons reaching marrying age during the current period, are now adversely affecting the number of marriages.

Because marriages by month on a current basis are not obtainable for the United States, the National Office of Vital Statistics publishes data on marriage licenses, rather than marriages, for most States. On an annual basis, the number of marriages is 1 to 3 percent less than the number of marriage licenses. Monthly figures on marriage licenses start with data for 1944, and annual figures on marriages go back to 1867.

Figures on marriage licenses for city areas that have populations of 100,000 or more are available by month starting with 1939.

Divorces

Current monthly figures on divorces for 19 States are published in the *Monthly Vital Statistics Report*. A somewhat larger group of States will be represented in the 1953 issues of this report. Annual estimates on divorces in the United States are available from 1867 through 1951.

Birth Statistics in Maternal and Child Health Programs

By WILLIAM HAENSZEL, M.A.

MANY convincing reasons can be advanced for processing all data from birth certificates as a single integrated operation. The data cannot, for example, be segregated into two watertight compartments—legal and medical. Such items as race, place of delivery, and previous child-bearing history of the mother are all part of the legal certificate, which is handled by the bureau of vital statistics, but they must also be taken into account in tabulating and interpreting the medical data, which in some places is handled by maternal and child health personnel. Processing a single punch card eliminates some duplication of work and simplifies scheduling of coding, punching, and tabulating procedures. Furthermore, the bureau of vital statistics is best equipped to conduct follow-up inquiries to complete information and routinely match infant death certificates with birth records. Desired birth tabulations can be furnished to maternal and child health administrators.

This paper deals primarily with problems of collection and analysis of material usually found on the medical supplement of the birth certificate, including data on fetal and neonatal

deaths. Recapitulating and summarizing developments in this field since 1940 has been greatly simplified by activities undertaken by the Public Health Conference on Records and Statistics, the Association of Maternal and Child Health and Crippled Children Directors, the National Office of Vital Statistics, and the Children's Bureau. Where opinion has crystallized, these organizations have made recommendations on definitions and tabulations for birth weight and related characteristics (1, 2).

Definitions and Grouping of Items

The need for and importance of standard definitions and procedures cannot be overemphasized. Comparisons—between hospitals and local areas within the State as well as on the interstate and international levels—are the heart of this enterprise. Each maternal and child health administrator has a stake in having tabulations for his jurisdiction which can be compared with experience elsewhere.

For death certificate terminology, there is the standard medical certification form and the elaborate machinery of the International Statistical Classification of Diseases, Injuries, and Causes of Death, and ancillary instruction manuals. For birth certificates, the phrasing and presentation of certain medical supplement items is still under study. The International List is not completely suitable for classifying complications of pregnancy and labor or operative procedures.

Lack of standard groupings for birth weights has been a deterrent to interarea comparisons of the proportion of immature births and

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weight-specific mortality rates. The distribution curves according to birth weight for live births and neonatal deaths exhibit steep gradients, at the smaller weights particularly. Differences of only a few ounces in class limits render the data virtually incomparable.

A detailed grouping of birth weights in intervals of 250 grams, with corresponding avoirdupois weights, has been published (1). The intervals have been so arranged that one division point, 2,500 grams (5½ pounds), coincides with the weight criterion for an immature birth in the International Statistical Classification.

The importance of hospitals following standard procedures for recording birth weight is obvious (1). They should report in the units of measurement appearing on their scales (metric or avoirdupois) and not attempt to convert birth weights. Failure to report birth weight on the birth certificate for even a small proportion of births can distort data on incidence of immaturity and mortality in low weight groups. The residual group of unweighed babies will consist almost entirely of immature infants, because of the tendency to leave very small babies unweighed, and can be sizeable in relation to the number of babies actually reported in the smaller weight groups. Routine checks should be maintained on the completeness of birth weight reporting for individual hospitals.

Length of pregnancy is used principally for the adjustment and distribution of unknown or not stated birth weights. Improvement in reporting on this item will eventually make possible the joint use of birth weight and gestational age data for indicating maturity of the newborn child.

Tabulations for individual hospitals should refer to the hospital where delivery occurred, unless clearly specified otherwise. This is important in areas maintaining special premature nursery facilities, to which babies are transferred from other hospitals. Separate tabulations will usually be maintained for "transferred babies."

Pregnancy and Labor

The International Statistical Classification cannot be considered an entirely suitable frame-

work for classifying complications of pregnancy and labor. To date classifications have been constructed from terms actually reported on the birth certificate. Complications fall into three major groups—labor, pregnancy, and nonpuerperal. It is not difficult to develop a list of titles within each of these groups. Trouble arises when specific terms are collected under each title. Such categories as "dystocia" or "disproportion of fetus" can cover a wide variety of conditions. Differences in incidence and mortality for certain complications can often be traced to noncomparability in conditions covered. In the absence of a standard classification system, it is of great importance that the kinds of complications under each title be clearly specified in publications (preferably in an appended glossary of inclusions).

An investigation of hospital records for a birth certificate sample in upstate New York revealed extensive under-reporting of complications (3). Reporting was more complete for deliveries involving fetal or neonatal death, or cesarean sections. Under-reporting could be confirmed anywhere by tabulating the proportion of certificates with reported complications by hospital. In Connecticut (1948) this proportion ranged from 3.3 to 26.3 percent for individual hospitals (4); reporting was better in the larger hospitals with well-organized obstetrical departments.

A check-list format for the medical supplement has been recently introduced in New York State and, according to a preliminary study, increased the incidence of total complications reported from 14.4 to 17.3 per 100 births (5). Anemia, premature separation of placenta, postpartum hemorrhage, breech and other malpresentations, heart disease, and syphilis were among the complications for which better reporting was noticeable. The design of the medical supplement should call attention to reporting of operative indications as complications or physicians may omit reporting complications obviated by resort to surgery (4).

Comparison of unpublished data collected by the Connecticut and New York State Departments of Health has revealed close correspondence in rates for certain complications for which there was substantive agreement in conditions covered. The two areas resemble each other

closely in many vital statistics indexes, and these comparisons enhance the confidence to be placed in the stability of the data. They indicate that the birth registration system can deliver descriptive results, even though subject to some distorting biases.

The code for delivery procedures in the International Statistical Classification needs some modification. No serious objection can be raised to the grouping of mid and high forceps, in view of their infrequency and the difficulty of distinguishing between them from birth certificate reports. However, the combination of breech extraction and of version and extraction under "manipulation without instruments" seems unwise. The two procedures have different characteristics when analyzed with respect to complications and mortality.

Connecticut data have demonstrated marked disparity between hospitals in the proportion of low-forceps deliveries, which could be traced to disagreement as to whether terminal or prophylactic forceps constituted an operative procedure and were to be so reported on the birth certificate (4). Current Connecticut practice has been to code prophylactic forceps as low forceps. There is no pressing need to distinguish between low-forceps and spontaneous deliveries. In many areas, mortality rates (both fetal and neonatal) have been reported without exception as lower for low-forceps deliveries. This held true even when the rates were adjusted in Connecticut to take account of the smaller birth weights among babies delivered spontaneously (4).

The check-list approach, discussed for complications, could readily be extended to cover delivery procedures.

Malformations and Birth Injuries

The Sixth International List provides a suitable scheme for classifying congenital malformations. The classification for birth injuries appears unduly condensed, segregating only intracranial and spinal injuries from other birth injuries. Separate categories for fractures, facial paralysis, and brachial plexus injuries could be provided.

Congenital malformations and birth injuries are not always apparent when the birth certificate is made out. Consequently, reporting on

the medical supplement must be regarded as incomplete. The degree of under-reporting can be approximated by comparing neonatal death certificates mentioning malformations or birth injuries with the corresponding birth certificate. Reporting of birth injuries is definitely poorer than for congenital malformations, only one-third of the birth injuries having been reported, according to the New York State data (6).

Neonatal deaths

A neonatal death is defined as one occurring less than 28 days subsequent to birth. The following groupings of ages of death (1) should suffice for most purposes: under 1 hour; 1 to 23 hours; single days to the end of the first week; 7 to 13 days; 14 to 20 days; 21 to 27 days.

Causes of death may be grouped for tabular presentation. Reference 2 gives a list of 45 selected causes.

Handling Neonatal Death Data

Three specialized procedures necessary for the handling of birth and neonatal death data deserve comment.

1. Matching birth and death records is without doubt the most important single step to be taken in the development of adequate birth statistics. Provisions for matching should always include neonatal deaths and, if possible, deaths under one year of age.

2. Combining data from matching birth and death records on a single punch card is a prerequisite for the efficient handling of neonatal death tabulations. At least the following information should be available (1):

From the birth certificate: Certificate number; place of birth, including identity of hospital; place of residence; attendant; sex; plurality; month and year of birth; race; age of mother; order of birth; birth weight; length of pregnancy; and any other medical and health items that are usually punched.

From the death certificate: Certificate number; age at death; cause of death; place of death.

3. Adjustments to take account of the "not stated" birth weights are necessary. Reports of birth weight are more likely to be omitted for grossly underweight babies, including those

Table 1. Weight-specific neonatal death rates per 100 live births, New York City, 1949

Birth weight		White		Nonwhite	
		For known birth weights	Adjusted for unreported birth weights	For known birth weights	Adjusted for unreported birth weights
Total.....		1.5	1.8	2.2	2.8
<i>Grams</i>	<i>Pounds</i>				
Under 2,500.....	5 pounds 8 ounces or less.....	11.7	14.1	11.2	14.4
2,500 and over.....	Over 5 pounds 8 ounces.....	.6	.7	.9	1.0
Under 1,000.....	2 pounds 3 ounces or less.....	93.4	97.4	82.4	88.5
1,000 to 1,499.....	2 pounds 4 ounces to 3 pounds 4 ounces.....	43.3	47.0	39.0	40.7
1,500 to 1,999.....	3 pounds 5 ounces to 4 pounds 6 ounces.....	14.6	16.9	12.5	14.8
2,000 to 2,499.....	4 pounds 7 ounces to 5 pounds 8 ounces.....	3.1	3.5	3.0	3.6
2,500 to 2,999.....	5 pounds 9 ounces to 6 pounds 9 ounces.....	.9	1.0	1.1	1.3
3,000 to 3,499.....	6 pounds 10 ounces to 7 pounds 11 ounces.....	.5	.6	.8	.8
3,500 to 3,999.....	7 pounds 12 ounces to 8 pounds 13 ounces.....	.5	.5	1.0	1.0
4,000 to 4,499.....	8 pounds 14 ounces to 9 pounds 14 ounces.....	.7	.7	.5	.5
4,500 to 4,999.....	9 pounds 15 ounces to 11 pounds.....	1.2	1.4	1.0	1.0
5,000 and over.....	11 pounds 1 ounce or more.....	4.5	6.2	0	0

NOTE.—Adapted from a table published by the Bureau of Records and Statistics, New York City Department of Health. The class intervals in grams are not precisely those recommended by reference 2. The avoidupois limits have been inserted to illustrate presentation format and may not represent exactly the weight groupings used.

born dead or with poor prospects for survival. Mortality rates, based only on known birth weights, understate seriously the true rates. The size of the correction in mortality will usually be greater for fetal deaths than for neonatal deaths. Allocation of unknown birth weights can be handled through a number of procedures now in effect (2).

Table 1 illustrates the effect of adjustment on weight-specific neonatal mortality rates. The correction is greatest for the under 1,000 grams group, becomes negligible in the 2,500- to 4,500-gram range, and then reappears at higher weights.

Tabulation of Data

Tabulations of medical supplement data have a wider audience than maternal and child health administrators. The needs of medical society committees, hospital superintendents and staffs, and of interested physicians must also be kept in mind.

Reference 2 outlines suggested tabulations for birth weight and related characteristics. Reduced to skeleton form, the suggested tabulations are:

1. Live births (and neonatal deaths) classi-

fied by birth weight, race, and county of residence (with subtabulations for cities of over 50,000 population).

2. Live births (and neonatal deaths), classified by birth weight and individual hospitals (also group hospitals according to size).

3. Single live births (and corresponding neonatal deaths), classified by birth weight, race, and person in attendance.

4. Single live births (and corresponding neonatal deaths), classified by birth weight, race, and sex; neonatal deaths further subdivided by age at death and by cause of death.

5. Plural live births (and corresponding neonatal deaths), classified by birth weight, race, and sex; neonatal deaths further subdivided by age at death and by cause of death.

6. Live births (and neonatal deaths), classified by birth weight, race, period of gestation.

Note: This report does not cover such topics as complications of pregnancy and labor, operative procedure, birth injuries, or congenital malformation.

The cross-tabulation "Birth weight by area of residence" may throw light on possible relationships between environmental factors and incidence of immaturity. It will delineate

the geographical pattern for incidence of immaturity and help determine those areas needing added special facilities for care of immature babies. Where nearly all deliveries occur in hospitals, maternal and child health administrators would probably rely on hospital rather than area-of-residence tabulations for pinpointing the need for special facilities.

Data on birth weight for individual hospitals is usually more informative than data for hospitals grouped according to size. They enable an investigator to pick out hospitals diverging from the usual pattern. Published analyses should refer to the distribution pattern by individual hospitals, identifying individual hospitals by code number, if necessary, as well as presenting figures for hospital groups by size of hospital.

Only one hospital was found in Connecticut (1948) where the distribution of immature birth weights deviated significantly from the State average. Where such differences are found, they should not be accepted at face value. Scales and weighing procedures in an individual hospital may have been at fault and may have biased the results. One must assess the hospital practice and the type of people it serves in interpreting the findings. In the Connecticut hospital, later developments suggested that weighing procedures were at fault.

The question has been raised whether adjusted mortality rates based on weight-specific rates should be computed for individual hospitals. In my opinion, this should not be done routinely. Where differences in birth weight distributions are small, the changes produced by adjustment are negligible. If the deviations are major, the question as to whether they are real or classification artifacts must first be answered. If the weight differences are real, use of adjusted mortality rates could be justified. Inaccurate recording of weights rewards the hospital with a lower adjusted rate than warranted (when the bias is toward lower weights) or penalizes it with a higher rate if the bias runs in the opposite direction.

Interhospital mortality comparisons are clouded in many States because of complications caused by the presence of small maternity homes, and municipal and proprietary hospitals. Maternity homes may handle mainly

uncomplicated deliveries; proprietary hospitals may draw patients from a well-to-do clientele who constitute better risks; municipal hospitals usually treat medical indigents, who may be poorer risks, and may draw the emergency cases with poorer prognosis. Under these conditions, the factor of treatment and its effects cannot readily be disentangled from selection of cases.

These selection elements are minimized in Connecticut, where no more than two hospitals were engaged in large-scale obstetrics in any community, no municipal or proprietary hospitals were involved, and maternity homes were not permitted to operate. All general hospitals in the larger cities have active staffs, and outward appearances would indicate no significant differences in types of patients admitted. For these reasons the accompanying abstract of Connecticut data (1948-50) on neonatal mortality per 1,000 live births (unadjusted) by hospital may prove interesting (table 2). Deaths are tabulated by hospitals where birth occurred, grouped according to size of hospital.

The mortality differences between hospitals

Table 2. Neonatal deaths per 1,000 live births, by hospital where birth occurred, Connecticut, 1948-50 (partial listing)

Place of birth	Rate per 1,000 live births
Total deaths in State	19.5
Deaths in hospitals:	
Total, all hospitals	19.1
Hospitals with 2,000 or more births yearly ..	18.0
No. 1	15.2
No. 2	16.3
No. 5	21.5
No. 6	21.7
Hospitals with 1,000-1,999 births yearly ...	20.5
No. 1	16.5
No. 2	18.2
No. 8	21.9
No. 9	25.8
Hospitals with 500-999 births yearly	19.3
No. 1	16.0
No. 2	16.8
No. 8	22.3
No. 9	27.2
Hospitals with less than 500 births yearly ..	18.4

cannot be attributed to chance factors. Assuming that the neonatal mortality rate for the entire State represented the true risk in each hospital, the differences between the observed and the expected number of deaths could have occurred by chance much less frequently than once in 100 trials ($\chi^2=52.6$, d. f. 24). This hypothesis must be rejected. Differences between hospital size groups were unimportant, compared to those between individual hospitals. The same results would have held if reported fetal deaths had been combined with neonatal deaths to compute combined loss ratios.

Mortality rates by individual hospitals provide a powerful tool for maternal and child health administrators. They not only point out places for improvement, but, when distributed to the hospitals concerned, stimulate the staffs to examine and take steps to improve conditions.

A standard table of major importance, useful for interarea and time series comparisons, is mortality by birth weight (table 1). The administrator will probably be most interested in following the time trends in his area for mortality in the various weight groups to see what results his program is producing. Where space permits, both unadjusted and adjusted (for unreported birth weights) weight-specific rates should be shown, so the reader can gauge the size of the correction involved. Separate presentation of neonatal mortality and fetal mortality is imperative. With differences in legal requirements for reporting fetal deaths, present interarea comparisons of fetal mortality are greatly restricted.

It is well known that sex and race influence birth weight distributions; male and white babies weigh more, on the average, than female and Negro babies (7,8). Since female and non-white babies are generally more mature than male or white babies of equal weight, other things being equal, the former tend to exhibit smaller weight-specific mortality rates under 2,500 grams. The New York City data for non-whites bear this out.

Complications of Pregnancy and Labor

Tabular presentation should distinguish between the total births registered and the num-

ber of reports with answers to questions on complications. A count of deliveries exhibiting one or more complications should be presented, permitting comparison with the total number of complications reported. In Connecticut, the ratio of reported "complications" to "women with complications" has run between 1.10 and 1.15.

For clarity in presentation, grouping of individual complications under three major headings—complications of pregnancy, of labor, and nonpuerperal—seems desirable. The arrangement must be somewhat arbitrary because the line of demarcation between complications of pregnancy and of labor is not always distinct; for example, premature separation of the placenta could be associated either with the antepartum stage or with labor. Standard usage in the arrangement and grouping of complications can undoubtedly be developed.

The distribution of complications for plural deliveries departs noticeably from that for single deliveries and should be presented separately.

For single deliveries, complications affecting birth weights of babies weighing 2,500 grams or less should be distinguished from those for full-term babies. Further subdivision of birth weights expands the tables greatly, tends to obscure the results in a mass of detail, and should not be attempted as a routine measure. Plural deliveries are so few that the study of association between complications and birth weight can advantageously be confined to single deliveries. Data for plural deliveries could be accumulated and made the subject of a special report.

Tabulations of reports of complications by hospitals are of interest, primarily as a check on the quality of reporting from individual hospitals, taking into account any selectivity factor among patients. These reports offer the maternal and child health administrator some clues as to completeness of records maintained in various obstetrical departments. The maternal and child health administrator can use these tables as a springboard for making specific inquiries about record-keeping systems in individual hospitals. It is difficult to generalize as to where such inquiries may lead. Depending on the interest and cooperation of the hospital

staff, results might include revision of hospital forms and more frequent review of case records by chiefs of services.

In Connecticut (1948) the proportion of live births with complications reported ranged, by hospital, from 3.3 to 26.3 percent. In addition to such complications as dystocia, disproportion, and malpresentations other than breech (for which lack of precision in definition contributes to variability), reporting varied markedly for toxemias (other than eclampsia), placenta previa and other antepartum hemorrhage, erythroblastosis, and breech presentation.

Presentation of mortality data requires separate tabulation of complications for neonatal and fetal deaths. The general breakdowns for single full-term, single immature, and plural deliveries should be maintained. Preceding comments concerning separate presentation of fetal death and neonatal mortality apply here also. When the numbers observed are relatively few, consolidation of certain complications for the computation and publication of rates may be indicated. At best, such

tables are voluminous and the reader's task may be eased by arranging the complications in descending order of mortality.

Table 3 is an abstract of material on mortality according to complications. For convenience in reproducing the results, only the rates are shown. Antepartum hemorrhage was the complication of pregnancy with the highest combined mortality; hemorrhage, for complications of labor; diabetes was the leading nonpuerperal complication. The variable relationship between fetal and neonatal mortality and the mortality pattern for full-term and immature deliveries should be noted. Because of variation in reporting complications by hospitals, routine analysis of mortality by complications for individual hospitals would not be feasible.

Medical society committees and hospital staffs, as well as health departments, have always expressed keen interest in tabulations of delivery procedures for individual hospitals. In Connecticut, such data have been released, with the hospital identity concealed by code.

Table 3. Fetal loss per 1,000 births,¹ by complications of pregnancy and labor, Connecticut, 1948

Complications of pregnancy and labor	Total			Single, full-term			Single, immature		
	Combined fetal loss	Deaths under 1 month	Fetal deaths	Combined fetal loss	Deaths under 1 month	Fetal deaths	Combined fetal loss	Deaths under 1 month	Fetal deaths
Questions on complications answered.....	31.0	18.1	13.2	13.9	7.2	6.7	268	180	108
No complications.....	16.0	12.2	3.8	7.3	5.6	1.7	178	137	47.4
One or more complications.....	113	51.9	64.0	55.7	18.1	38.3	441	280	224
Complications of pregnancy.....	195	92	113	89	27	64	473	298	249
Antepartum hemorrhage (including placenta previa and premature separation of placenta).....	263	146	137	107	40	70	541	377	264
Toxemias (including eclampsia and hypertension).....	125	33	95	64	10	55	395	171	271
Infections of pregnancy.....	55	16	39	19	-----	19	214	153	71
Complications of labor.....	92	31	63	62	17	46	432	233	259
Hemorrhage.....	495	56	466	418	20	406	862	500	724
Breech presentation.....	129	69	64	69	30	39	515	377	222
Malpresentation other than breech.....	62	21	42	48	16	33	333	111	250
Dystocia.....	46	22	24	34	12	23	128	89	43
Previous cesarean section.....	29	26	4	21	21	-----	77	40	39
Nonpuerperal complications.....	122	62	73	71	20	53	500	357	222
Diabetes.....	455	268	255	340	143	234	1,000	1,000	333

¹ Rates for "combined fetal loss" and "fetal deaths" are per 1,000 total births (i. e., live births plus fetal deaths). Rates for "deaths under 1 month" are per 1,000 live births. "Fetal deaths" refer to fetuses of not less than 28 weeks gestation.

Table 4. Percentage of live births by cesarean section in Connecticut hospitals, 1948

Size of hospital (number of births)	Average (group)	Individual hospitals
Total, State-----	5.6	-----
2,000 or more-----	6.4	12.1, 7.8, 5.4, 4.8, 3.2, 1.4.
1,000 to 1,999-----	4.3	8.2, 6.9, 5.4, 5.2, 4.5, 4.2, 3.0, 2.2, 1.4.
500 to 999-----	6.3	12.5, 10.9, 8.3, 6.7, 5.2, 5.1, 4.9, 2.6, 1.9.
Less than 500---	3.0	10.0, 6.0, 4.1, 3.8, 2.8, 2.4, 2.4, 1.6, 1.3, 0.9.

These data have indicated little variation by hospital for version and extraction; the tabulations pinpoint a few hospitals with high rates for this complication. The variation has been more pronounced for mid- and high-forceps deliveries, but, again, the tabulations picked out a few hospitals with rates markedly above average.

The great difference between Connecticut hospitals has been in the proportion of babies delivered by cesarean section. The figures do not appear directly related to hospital size (table 4), although the lowest proportion of cesarean sections is found in the smallest hospitals. Differences of the magnitude observed must represent differences in concepts and procedures rather than differences in problems encountered.

The concepts underlying Lembcke's recent study (9) and investigations of delivery procedures would seem to be essentially the same. Increasing attention in the future will probably be devoted to vital statistics studies dealing with interhospital variation.

The proportion of deliveries by cesarean section has increased steadily in Connecticut during recent years. A similar trend has been evident in New York City and upstate New York. Mid- or high-forceps delivery, breech extraction, and version and extraction have declined (table 5).

Because of the great interhospital variation in proportion of cesarean sections, marked changes in the trend for cesarean sections are potentially possible. Repeated tabulations on delivery procedures at regular intervals seem desirable.

Not much demand has developed for detailed cross tabulations of delivery procedures by complications, since the selection of delivery procedure is generally dictated by the complication. Physicians have been satisfied with tabulations of operative procedures by broad groupings of complications.

Neonatal and Fetal Deaths

Studies made by Yerushalmy (10) several years ago demonstrated a relationship between neonatal and fetal mortality and birth order and age of mother. In view of the declining neonatal and fetal mortality rates, presentation of current data on these points should be encouraged. Where differences in mortality by birth order and age of mother still exist, some special tabulations of complications and birth weight by these factors might be undertaken to see if they could account for all or part of the differences in mortality.

Gardiner and Yerushalmy (11) demonstrated that the risk of neonatal and fetal mortality was much higher for mothers whose child-bearing history showed previous loss of children. This line of investigation could profitably be extended to consider complications reported for such women in a current delivery and the birth weights of the babies, as well as resultant mortality.

Medical certifications for neonatal deaths rarely allude to conditions present in the mother in the sequence leading up to the underlying cause of death of the infant. This is one reason why it is difficult to reconcile cause-of-death distributions for early neonatal and late fetal deaths, which theoretically should closely resemble each other. The situation might be accounted for in part by lack of information

Table 5. Change in percentage of live births by procedures specified, Connecticut, 1948 and 1941

Delivery procedure	Year		Percent change
	1948	1941	
Cesarean section-----	5.6	3.2	+75
Mid or high forceps-----	3.6	4.2	-14
Breech extraction-----	1.6	2.1	-24
Version and extraction-----	.3	.5	-40

available to the certifying physician concerning the obstetrical history of the mother. Neonatal death certifications could be reviewed in connection with complication data reported on the matching birth certificate to see if further inferences could be drawn concerning cause of death. This might lead to improvement of medical certifications for neonatal deaths.

The last revision of the standard stillbirth certificate removed the question on time of death—before or during delivery. Some people hold that this item helps in the interpretation of fetal death statistics and that causes of fetal death should routinely be cross-tabulated with time of death. States which have retained time of fetal death on their certificates should incorporate this element into their tabulations of causes of fetal deaths.

Drawing Samples for More Intensive Study

The assessment of preventability of fetal and neonatal deaths is a project which excites the interest of maternal and child health directors. The success which has attended the investigation of individual maternal deaths to determine preventability and the subsequent confirmation, as indicated by the decline in maternal mortality rates, of the findings that many of the deaths were preventable, has led many people to believe that the same methods of inquiry should be applied to fetal and neonatal deaths. A sampling approach would be indicated since there would be too many fetal and neonatal deaths for each to be investigated.

In Connecticut, a State Medical Society Committee to Study Stillbirth and Neonatal Mortality has recently been organized with both pediatricians and obstetricians represented in its membership. Members have been drawn from a large number of hospital staffs to secure a broad base of representation.

The committee is just beginning to study a sample of neonatal deaths. Standard sampling techniques are being used to select cases for study, so that inferences from the sample can be extended to the total neonatal deaths in the State. In Connecticut the decision has been made to draw the sample in the State office. The health department physicians doing the field work find that assembling of informa-

tion through review of hospital records and interviewing physicians is progressing satisfactorily. As yet, the committee has not fixed a procedural pattern for reviewing and evaluating the material collected.

Complete work-up of individual deaths calls, of course, for microscopic examination of tissues. This, too, could be fitted into the sampling scheme. Tissues could be stored in the hospitals temporarily until after the sample is drawn and specimens then discarded for deaths not included in the sample, if the specimens are not wanted for other purposes.

Statistical Program Operations

Tabulation of the birth statistics considered in this paper consumes a great amount of personnel and machine time. Many projects await study by public health statisticians, and the allocation of statistical resources to work demanding attention is a major responsibility confronting statistical administrators. This pressure automatically raises certain questions concerning such a major activity as the medical supplement program: Must the data be processed completely every year? If not, is continuous sampling the answer? Is a cyclical approach satisfactory? Can a complete analysis be done one year, dropped, and picked up in a later year? Would a 2- or 3-year cycle of operations be needed, using the initial year of the cycle to improve the quality of responses on the medical supplement?

The problems of State offices with respect to coding, tabulating, and other handling of records make the complete processing of records in selected years the most attractive approach. Many offices would have no difficulty in building up a cycle of operations in which medical supplements alternate with such projects as multiple cause-of-death tabulations, and with special tables and rate computations for census years.

Conclusion

Many studies have been stillborn when the prospective investigators have concluded the data were too unreliable to bear analysis. No one working with the birth certificate medical

supplements has ever believed that this material was a model of statistical precision and accuracy, but this did not deter the pioneers in this field, and some benefits can now be reaped from their work.

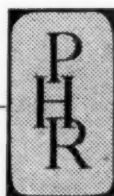
Much has been printed recently concerning computing machines and servomechanisms which have so-called feed-back facilities. The feed-back principle should be borne in mind in essaying the analysis of medical supplement data. Material is salvaged from the initial investigations, not only for its immediate interest, but as a means of stimulating the sources of information—the physicians—and encouraging them to improve their reporting practices. With repetition of the interaction cycle between physicians and statisticians, the quality of the data can gradually be improved. The handling of the medical supplement data on birth certificates, a generally accepted health department activity, may provide useful experience to statisticians in the problems and mechanics of handling medical care data. These statisticians will later attack problems concerning the collection and improvement in quality of medical data in other fields of interest to public health administrators.

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The complete text of this paper may be obtained by writing to the Bureau of Vital Statistics, Connecticut State Department of Health, Hartford.





The Practice of Public Health, 1952

“WE ARE MET to reexamine our responsibilities, to analyze our progress, and to plot our future course. During our deliberations we shall discuss the health needs and problems of the people whom we serve. We shall study new scientific and social developments which should be incorporated into public health programs, and we shall analyze the progress we have made in bridging the vast gap between scientific knowledge and its application to the health needs of the people. Underlying all these discussions will be a strong sense of our stewardship for the health protection of our nations, a realization that as public health workers we have both the privilege and duty of serving the people who have entrusted us with the responsibility of safeguarding their health and have given us a specific mandate to concern ourselves with the interests of health and life among the people.”

GAYLORD W. ANDERSON, M.D., Dr.P.H.,
President, American Public Health Association, 1951-52

a topical
and selected
report of the
80th
annual meeting
of the
AMERICAN
PUBLIC
HEALTH
ASSOCIATION

and related
organizations
held at
Cleveland, Ohio,
October 20-24, 1952

Reader's guide on page 86.

The APHA Conference Report

This is *Public Health Reports* third effort—the first being in 1950—to summarize the scientific and technical discussions at the annual meetings of the American Public Health Association and related organizations. We consider it a privilege so to serve our readers, many of whom have expressed their satisfaction with our previous efforts, and to be able to carry on as urged by the Executive Board of the Association.

The earlier pattern of a news-type reporting of the highlights of many of the sessions has been followed in this presentation, the second portion of which will appear next month. We have attempted to give the essence of the papers, but by no means the complete story in each case. We have endeavored to reflect accurately the intent of each speaker although necessarily we have had to take extensive editorial liberties in the interest of brevity and under the press of time. It must be clear, of course, that the author—not the Public Health Service—is the authority in each case for facts and opinions reported.

This is a selective report, largely because we work from authors' written texts as made available through the pressroom facilities of the Association at Cleveland, and by authors on direct request. Material which was not available in satisfactory script form obviously could not be used. Reporting of informal panel-type discussions is, in consequence, incomplete.

The report this year is, item by item, somewhat longer and possibly more complete than in the past since virtually all summaries were prepared from full texts. Even so, only highlights could be reviewed, reports averaging in length from 10 to 15 percent of the originals. Thus, reading of our news-reviews cannot in any way substitute in concept or details for examination of the full papers when published.

This special two-part section deals only with the scientific sessions. Association and section business and reports have not been reported, this being a function of the official *Journal*. No full papers, of course, are published in this summary report. Complete texts of leading papers have already begun to appear in the *American Journal of Public Health*. Subsequently, others may appear in *Public Health Reports* and in appropriate specialty journals.

Our appreciation is extended to the many authors who provided us with texts—especially those who did so early—and to the officers and staff of the American Public Health Association for their cooperation and encouragement.

THE EDITORS

policed—the description and exemplification of successful methods of preventing the progress of pestilences by stamping them out, the mapping out of the course of epidemics, and the demonstrated progress of science which is destined to grapple successfully with the combined factors of epidemic and other preventable diseases, show how great are the tasks and the triumphs which Preventive Medicine has proposed. . . .

Sanitary officers and boards of health have to perform their duties under laws which, in most of the States, are not worthy of an enlightened people. A sanitary system worthy of the present state of the physical sciences and of hygiene hardly has existence in any of the States. But in eight States a central Board of Health has begun its work of inquiry and the framing of a project of public health laws, a parliamentary commission in the Dominion of Canada is at present devising a sanitary code, and in nearly half of the States of our Union efforts to secure good laws and a sanitary system have commenced. Certainly it is not in vain that the American Public Health Association pursues its voluntary inquiries and now presents these contributions to a great cause in which philanthropists and statesmen are enlisted as co-workers with medical and sanitary authorities.

—ELISHA HARRIS, M.D., secretary of the Association, in an "Introductory Note" to "Public Health Reports and Papers presented at the meetings of the American Public Health Association in the year 1873."

The Control of Chronic Illness and Efforts in Rehabilitation

Chronic illness and rehabilitation were among the leading topics discussed by the some 4,000 professional people in public health who participated in the APHA's 80th annual meeting in Cleveland, Ohio. From Georgia came a report on a cardiac control program; from North Carolina came news of diabetes control clinics. Investigators in Canada reported on social and environmental factors in multiple sclerosis. Incapacitated American coal miners do not take kindly to enforced idleness nor public assistance, and a total physical medicine and rehabilitation program can realize important social and economic savings . . . such were some of the findings, summarized in the following.

Cardiac Clinic Network Feature of Georgia Plan

The cardiac control program developed in Georgia has, in the opinion of J. Gordon Barrow, M.D., director of the cardiac clinic at Grady Memorial Hospital, Atlanta, done more to advance the fight against heart disease than would have been possible by any other means with such a small expenditure of money. The program, made possible by the combined efforts of many individuals and agencies, both public and private, includes a State-wide network of clinics for diagnosis and care of indigent patients, professional education, and research.

When the program began, Dr. Barrow stated, only two cardiac clinics existed in the State, one at each of

the two medical schools. These were made into strong regional clinics with the intention that they would provide consultation services and diagnostic and treatment facilities for local clinics. At present eight local clinics are in operation and three more are ready to begin.

Initial Steps

Outlining the steps taken to develop a local clinic, he listed these: find qualified physicians willing to devote their time without charge to the operation of the clinic; obtain approval of the project by the local medical society; enlist the aid of the local health officer; and finally, call a conference of representatives of the State health department and the State heart association, the local physicians who have volunteered their services, the local health officer, and often members of local civic organizations to formulate final plans.

These clinics, according to Dr. Barrow, provide diagnosis and treatment, including surgery; utilize methods of prophylaxis to prevent heart disease or halt its progression; give medical, nursing, and social service care to patients with serious heart disease; provide a home-care program; and aid in rehabilitating patients. The average total number of patients visiting the clinics per month has been 2,911, Dr. Barrow reported. Home nursing visits average 830 per month. On the average 31 doctors attend each clinic session, of which there have been 82 per month.

A system of recording the diagnosis and functional and therapeutic classifications of each patient was devised, following the standards of the American Heart Association, Dr. Barrow explained. Copies of notes made by the physicians are sent to

the nurses in the field, and the nurses' reports are made available to the physician. "We feel that each member of the medical team must be fully familiar with what is going on if proper follow-up of the patient is to be accomplished," Dr. Barrow maintained. "Good records are the only possible way this can be done."

Professional Education

Discussing the educational phase of the program, the speaker noted that in the past 2 years more than 25 symposiums have been held under the sponsorship of the State health department and the State heart association to acquaint physicians and nurses with recent advances in heart disease therapy. He mentioned also that the clinics have co-operated in the educational program by holding staff conferences for the nurses and physicians and by making available their facilities for use by medical students.

"The research program is necessarily centered at the two medical schools," Dr. Barrow pointed out. At present several different cardiovascular research projects are under way. But, he added, each clinic is urged to sponsor clinical research programs since these require only carefully kept records and critical analysis.

Many Served Economically In North Carolina Clinics

The belief that the operation of a clinic for diabetes offers an opportunity for the public health department to do much good for many people for a comparatively small expenditure of money was expressed by W. B. Hunter, M.D., health officer of the Harnett County Health Department, Lillington, N. C.

"Six years ago," Dr. Hunter said, in describing the beginning of the Harnett County Health Department's clinic, "we found some diabetic patients who were not receiving adequate care. We helped a few

of these people with such gratifying results that . . . we soon found ourselves conducting a clinic for diabetes." Later, he explained, it was decided to admit obese patients too, since obesity and diabetes are closely related. The clinic has had a total of 506 patients, well over 1 percent of the county's population.

The management of diabetes is preventive medicine, Dr. Hunter pointed out. Physicians do not treat diabetes—they teach the patient how to manage his own individual case, he said. The objective is to prevent complications and to keep the patient as near normal as possible.

Clinic Procedures

When a new patient is admitted to the clinic, he continued, he is weighed, his height is measured, and his ideal weight is estimated. A urinalysis and a blood sugar determination are done. Usually, these data establish the diagnosis, show whether the patient is overweight, and give some indications of the severity of his disease. If it appears that the patient will require insulin, he is taught how to administer it. Finally, he is given instructions concerning diet. At this first visit, then, the patient is well started on the management of his disease. At subsequent visits the insulin dosage is regulated according to results of urine tests and occasional blood sugar tests. Diet is regulated according to the gain or loss of weight.

Describing the diets prescribed by the clinic, Dr. Hunter emphasized that they are simple and versatile. Diabetics do not require any special foods, he said, but if overweight they must restrict the total calories they consume. For several years, the clinic has used exclusively the meal plans and the booklet "Meal Planning," prepared by the American Diabetes Association, the American Dietetic Association, and the Public Health Service, as a basis for their diet instructions.

Dr. Hunter recommended that the staff for a diabetes clinic include a

physician, a dietician, a laboratory technician, and a clerk. The physician may be either the health officer or a clinician employed for the purpose. And, as happened in the Harnett County Health Department clinic, the nursing personnel may learn to serve as dietician and laboratory technician.

Social Factors Absent In Multiple Sclerosis

A comparative study of 112 multiple sclerosis patients and a selected control group of 123 representative individuals in Winnipeg, Manitoba, found no environmental or social factor that could be considered significant in the etiology or subsequent course of the disease, reported Knut B. Westlund, M.D., M.P.H., and Leonard T. Kurland, M.D., Dr.P.H.

Dr. Westlund is research associate of the department of epidemiology, Johns Hopkins University School of Hygiene and Public Health and Dr. Kurland is an epidemiologist with the National Institute of Mental Health and medical director of epidemiological projects, National Multiple Sclerosis Society.

Information obtained from each patient, they explained, included a thorough chronological and clinical history and description of himself and his illness, embracing such facts as important symptoms, previous illnesses, places of residence and number of rooms and persons in the households, occupations and hazards involved, emigration origins of himself or ancestors, travel, education, military service, exposures to animals, vaccinations and inoculations, and dietary habits.

Neurological and hematological examinations and serological tests for syphilis were made and the patient's hospital records were studied. No attempt was made to evaluate the influence of emotional upsets or minor trauma in the patient's premonitory experience, since it was felt that both the patient and his physician might tend to rationalize the

onset of his disease symptoms with such explanations. Except for questions relating directly to multiple sclerosis, similar information was elicited from the control subjects.

A comparison of the data showed no significant difference between the patients and the controls which might account for the onset of multiple sclerosis, the epidemiologists concluded. A controlled study of a large number of healthy people with a long follow-up period to see what types of them develop multiple sclerosis would be desirable, they added, but its incidence of 1 to 2 cases per 100,000 population per year is so low that the investigator can only obtain and try to evaluate premonitory information from persons already having the disease.

Rehabilitation Program For the Incapacitated

Incapacitated industrial workers do not remain unemployed or unemployable by choice, nor do they prefer to support their families through public assistance if there are any reasonable alternatives, declared Kenneth E. Pohlmann, rehabilitation director of the United Mine Workers of America Welfare and Retirement Fund.

UMWA rehabilitation efforts were begun in June 1948, said Mr. Pohlmann, by using outside (the mining areas) medical center services for the severely disabled, followed by expanded efforts when further needs, such as physical restoration services, were indicated. Subsequent steps included cooperation with Federal-State vocational rehabilitation agencies whereby selected patients, were referred for rehabilitation services to qualified agency representatives. By June 30, 1952, 8,693 handicapped people had been so referred by the UMWA.

As an example of the rehabilitation program's effectiveness, he continued, of 738 UMWA disabled beneficiaries leaving physical medicine or

rehabilitation centers by January 1952, 600 (81.3 percent) are still in discharge status and 169 are actively employed, 20 percent of them returning to mining. Thirty percent are in other industries, 32 percent are self-employed, 7 percent are in farming, 4 percent sought appointive or elective offices, and 8 percent are in diverse jobs.

Follow-up Care

All persons discharged from such centers are given extensive follow-up study and care by local physicians, hospitals, or one of the UMWA's 10 area medical staffs, Mr. Pohlmann said. Half of the 738 discharges show marked physical improvement, 43 percent have maintained various rehabilitation gains, and an impressive number have regained mobility with mechanical aids or are capable of self care.

Sixty-four percent of the 575 patients referred to local vocational rehabilitation groups participated in training and employment services. Only 18 percent quit because of physical regressions and unsatisfactory vocational goals. Mr. Pohlmann emphasized that if the 169 of these participants now employed were public assistance charges, the maintenance cost of each individual and family would be 500 to 1,400 dollars per year. This would entail a tremendous expenditure for the entire group over a number of years, he said.

Present workmen's compensation, relief and rehabilitation programs are inadequate to do a constructive job in rehabilitating the severely disabled, he concluded.

Washington, D.C., Solving Problems of Disabled

A total physical medicine and rehabilitation program offers the community an opportunity to realize significant economic and social savings and, more important, to help restore to the disabled person that

human dignity which is lost to the helpless and the dependent, declared Josephine J. Buchanan, M.D., of the Division of Chronic Disease and Tuberculosis, Public Health Service.

The Program

To show how such a program can be developed and what it can accomplish, Dr. Buchanan described the program begun 2 years ago at Gallinger Municipal Hospital in Washington, D. C.

"We began with two things," she said, "the barest minimum in personnel, space, and equipment, and a firm belief in the validity of the work we proposed to do." She explained that the philosophy on which the program is based is that a patient is not well until he is returned to his community as nearly a whole human being as our science, our work—and equally important, his effort—

can make him. To cure a patient of a disease or heal him of an injury is but the first step in the total treatment of a patient.

Home-Made Devices

Certain basic specialized medical equipment had to be purchased, she remarked, but the greater part of the equipment was built by the hospital: devices for lower and upper extremity exercises, parallel bars, practice stairs, and various self-help devices. A "gadget board" holding items, such as a dial telephone, water-faucet handles, and light switches, was devised for persons with residual disabilities in their hands and arms. An outdoor functional activity area, including a gravel pit, loading platform, garden, obstacle course, and even a city bus, was also developed, primarily for training those who earn their living by manual labor.

"Our Basic Mandate . . . To Keep People Well, Not Simply Keep Them Alive"

In his APHA presidential address, Gaylord W. Anderson, M.D., Dr.P.H., Mayo professor and director, School of Public Health, University of Minnesota, said:

"Many definitions of public health have been advanced, but probably none so simply or so clearly expresses the will of the people as the 1869 statute establishing the Massachusetts State Board of Health and instructing that board to 'take cognizance of the interests of health and life among the citizens.' No other concept has had comparable influence in shaping the course of the public health movement in this country . . . [It] has governed the evolution of public health and still defines the scope of our activities . . .

"Public health is an organized community program designed to prolong efficient human life. It has no artificial limitations that would restrict its activities to certain types of problems. It must deal with and endeavor to combat those forces that tend to impair or to shorten efficient human life and must meet each problem according to its particular needs. The essence of democracy is the concept of rule by the people, who have a right to protect themselves against all forces that lead to illness or to death. As public health workers and servants of the people we have been specifically instructed to 'take cognizance of the interests of health and life among the citizens.' If we neglect or fail to do so we will be derelict in our duty."

(Dr. Anderson's remarks appear in full in the *American Journal of Public Health* for November 1952, pages 1367-1373.)

The development of special devices, Dr. Buchanan pointed out, requires only a knowledge of the needs of the patient and the ingenuity to fulfill those needs.

Most important to remember, she said, is that "this newest and oldest form of medical care" must begin immediately with the onset of the disabling condition and must progress concurrently with the patient's other medical care. Delay in beginning treatment may mean failure.

60.9 Percent Independent

The program has given care to about 2,000 patients, she reported, 60.9 percent of whom have left the hospital totally independent and another 21.6 percent have been made partially independent. She mentioned two particularly dramatic cases—one, a young quadriplegic who, through the use of a special splint, has been enabled to take up cartooning; the other, a young man paralyzed in a swimming accident who now manages to type his correspondence school lessons.

Suggests Activities

Dr. Buchanan suggested the public health officer, or other member of a health department staff, as the person in the community to stimulate action in developing a program of physical medicine and rehabilitation. He can acquaint the community with the ways in which total restorative and rehabilitation services can help solve the problems which surround the disabled. He can participate on health and welfare planning committees. He can offer consultation service to his local vocational rehabilitation office and to the welfare department. He can encourage physicians to extend their limits of responsibility to the disabled patient. He can encourage the voluntary agencies to join together in planning for such a program.

Community Organization for Health: Practice and Precept

Concepts of "community organization for health" received refurbished definitions buttressed by concrete examples of cooperative action from widely separated areas of the country at sessions of the Conference for Health Council Work.

Under the title, "Community Planning for Local Health Services," reports were heard from Wisconsin, Massachusetts, Ohio, Pennsylvania, and Virginia. An evaluation of current concepts and a discussion of local relationships to national programs completed the presentations, all but one of which are reviewed below.

Community Organization Welds Social Groups

Discussing "new concepts" in community organizations for health—concepts which he felt were not new but did need review—Earl Lomon Koos, Ph.D., chairman of the sociology department of the University of Rochester, said:

"Community efforts directed toward better health are necessarily custom built. . . . Community organization for health cannot be carried on in an icy apartness from the social worlds in which the people live for whom it is designed, and because community organization cannot ignore the strength of the factors which create distinctive values regarding health, and which place

Practice of Public Health, 1952

Reader's Guide

	Page		Page
Chronic illness, rehabilitation	83	Medical administration	118
Community health organization	86	Weight control	124
Bacteriological research	90	Handicapped children	127
Home care	92	Infectious hepatitis	130
Cancer control	95	General practitioner	132
Overseas reports	99	J. W. Mountin memorial	134
Laboratory relationships	103	Venereal disease	136
Poliomyelitis	105	Professional training	138
Laboratory methods	108	Public Health in Transition	
Tuberculosis	112	A pictorial album beginning on page	88
Industrial hygiene	115		

those values high or low in the whole hierarchy of values that are part of American life. For we must remember that health is a value—and one which is forever in competition with other values in our society."

In Dr. Koos' view, community organization is a form of activity which attempts to "weld together" the individual members and groups of an area into "one group having a common purpose." He went on to discuss two kinds of concepts: those related to the individuals and groups, and those related to community organization as a social process.

Three Community Groupings

There are several types of identifiable groups in the community, Dr. Koos pointed out. The first centers in "ethnic identification," that focused upon the recognition of a common religious, nationality, or racial characteristic. "To plan programs without understanding the prescriptions and proscriptions of behavior which are present in each group's culture is to be unrealistic about what can be accomplished through formal organization."

"Ethos identification" is a second group, pointing up the reality of social class membership, the sociologist noted. He called attention to a recent study of a community of less than 5,000 which shows "that there are sharp differences in health attitudes and behavior among the social strata of that community, and that these relate very directly to the way in which that community organizes for health."

The third grouping centers on the family, which functions as an active agent in providing an atmosphere in which health can flourish and as an agent in caring for the individual in time of illness. Dr. Koos underscored the fact that the family also, "is the matrix within which many basic ideas and attitudes of the young are formed, and that it is genuinely effective in maintaining such ideas and attitudes throughout the adult years."

The Family Matrix

"We may well search," Dr. Koos went on, "the logic of industry- or school-centered programs that ignore the importance of the family as a 'conditioner of attitudes,' and that may send the individual back into his family to face conflicting ideologies about health and its value. . . . Such programs can work effectively only if they send the individual back to his family prepared to adjust differences that may have been engendered, to make him, in effect, a health organizer in his own small family world. If the individual is not so prepared—because the health program ignores the individual's emotional ties to his family—the cost in tensions and frustrations can outweigh any small good the program may have accomplished."

Turning to community organization as a social force, Dr. Koos recalled the truism that the individual gains from his membership in the group, and contributes to that group, only in proportion to his participation. The condition for effectiveness was described as an "atmosphere" in which the members have high morale, the opportunity and encouragement to communication with each other on a democratic basis, and the opportunity to "define the situation" or to "establish common values" on equal terms.

Conversely, the speaker pointed out that there are three concepts that can only inhibit effectiveness. One of these, he said, is the idea of the "hierarchy of ability," the belief that "we know what is best for people." Another is the "vested interest, that pride of possession and proprietary interest that tends to exclude others from dynamic participation." The third he cited as "the domineering need to dominate, characteristic of many individuals who stem from the authoritarian past."

"We cannot deny," Dr. Koos maintained, "that there is a hierarchy of ability, but it should be pointed out

that special abilities and knowledge should serve only to commission those who possess them to help the less fortunate to gain needed insights. It is not easy for many members of the community, especially those with a strong sense of *noblesse oblige*, to rid themselves of the second and third of these concepts, but somehow community organization must find the means—again through the group process—by which these can be abolished."

Milwaukee Groups Study Postwar Problems

Milwaukee County, Wis., like other metropolitan areas, faces public health problems resulting from postwar expansion and has begun to interest itself in community health planning, declared John S. Hirschboeck, M.D., dean, Marquette University School of Medicine. The citizens themselves, their elected county officials, public and private health agencies, and the Community Welfare Council of the city of Milwaukee are cooperatively planning public health programs.

County citizens and part-time health officers of the 18 suburban communities were opposed to a suggestion for a combined city-county health department. Despite some opposition, but facing an increasing number of complaints about inadequate sewage disposal, the Milwaukee County board of supervisors created a citizens' committee to study county public health needs, explained Dr. Hirschboeck. The citizens' committee, with the help of the research department and the social planning committee of the community welfare council, searched for a way to meet present public health needs without disrupting existing suburban programs.

Dr. Hirschboeck outlined the committee's proposed plan: A county bureau of health services would operate under the direction of a full-time public health officer. According

to their requirements, suburbs would purchase services from the bureau. The cost of operating the bureau would be prorated among the participating suburbs. The bureau would be responsible for sanitation in the county parks and would supervise medical aspects of civil defense planning. Hearings on the proposals have not been completed.

Ohio Emphasizes Local Health Planning

In Ohio, State public health planning is being stimulated by 50 community health councils and by many local units organizing health councils, reported Sewall O. Milliken, M.P.H., chief, division of public health education, Ohio Department of Health. Rural Ohio counties have received nation-wide acclaim for their health studies and successfully executed plans, he said.

Active local participation in State health planning is the concern of the Ohio Rural Health Council, organized in 1941, explained Mr. Milliken. Composed of 46 members represent-

ing 22 State organizations, an equal number of elected rural members, and 2 representatives of the Agricultural Extension Service, the council has developed a definite relationship between State and local community health service planning, by placing emphasis on local responsibility and by aiding local activities. Health education, dissemination of health information, the training of leaders, and study and survey of individual area health needs are projects under council sponsorship.

Other Organizations

The Ohio Committee on Public Health, an outgrowth of the Ohio Rural Health Council in 1949, studied the State's financial obligation to local health departments as provided by law. Other public health organizations cited by the author for their interest are: the Ohio Citizens' Council for Health and Welfare, the Ohio Public Health Association, and the State Planning Committee for Health Education.

An example of productive responsibility shared by several organizations is the brucellosis control pamphlet which Mr. Milliken de-

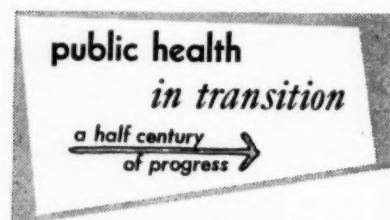
scribed as prepared cooperatively by the Ohio State Medical Association, the Ohio State Veterinary Medical Association, the State Departments of Health and Agriculture, and the Ohio State University Agricultural Extension Service.

Council Improves Services

Reorganization and expansion of city, county, and suburban health departments, a children's mental health center, hospital construction, a tuberculosis registry, a 5-year experiment in mass health education, institutes and courses in community health programs—these are among the accomplishments credited to the Metropolitan Health Council of Columbus, Ohio, according to the report by Russel G. Means, M.D., past president of the council.

Pennsylvania Revamps Laws and Structure

The revamped Health Department of Pennsylvania was described before the Conference for Health Council Work by Gilson Colby Engel, M.D., professor of clinical surgery,



The first 5 decades of America's 20th century have been a time of social and economic change and development . . . a time of population growth, sparked by immigration and the call of a free and bountiful land . . . a time of industrial expansion and urbanization, producing a rising standard of living and a greater longevity. This half-century has been a time of change and challenge to a new amalgamation of professions: public health. In these 50 years many needs, many problems came into view.

1900 Tuberculosis is leading single cause of death . untreated water, unpasteurized milk spread enteric diseases . one-third of all deaths occur under 5 years . 19,000 diphtheria deaths . heart disease and cancer deaths increase . influenza epidemic strikes Nation . pella-gra, rickets, goiter prevalent . 9 mothers die for 1,000 live births . traffic deaths appear among "first 10 causes" . malaria costs Nation half-billion dollars annually . 100,000 smallpox cases in 1921 . health hazards in industry mount . chronic diseases

1930 cause half of all deaths . over 500,000 VD cases reported each year . half of Nation's hospital beds for mental patients . 6 million sick on average winter day .
1940 disabling illness rivals premature death . shortages in personnel and facilities hamper health services . proportion of 65-year-olds doubles since 1900 . industrial and community wastes pollute United States waters . atomic age introduces new problems . health named a major factor in building international peace.

Beginning on the facing page, Part I of this album summarizes recognized needs and primary programs up to mid-century. Part II—next month—focuses on current and developing areas with an eye to tomorrow.

University of Pennsylvania Graduate School of Medicine, Philadelphia.

The Medical Society of the State of Pennsylvania, the 46 member organizations of the Pennsylvania Health Council, and the League of Women Voters were instrumental, he said, in the campaign for new health legislation, and the changes in the State's health organization were based on recommendations made in a survey by the American Public Health Association.

The APHA survey, "Keystones of Public Health in Pennsylvania," was used as a guide for the public health program reforms, Dr. Engel continued. The new laws created an Advisory Board of Health which advises the Secretary of Health and plans and fosters new health legislation; a merit system, applying to all public health personnel, to assure permanence of employment, equality and adequacy of pay, and impartial treatment, and to make provisions for economic security upon retirement; permissive legislation allowing any community to set up its own local health unit.

Community Units

The objective in Pennsylvania is to decentralize health services to the local level, with power to control at that local level, stated Dr. Engel.

The permissive legislation allows a community to set up its own health department, Dr. Engel explained. This local health unit, using qualified personnel, should provide six basic services: vital statistics recording; communicable disease control; environmental sanitation; laboratory services; maternal and child health care; and health education. One such unit now operating in Butler County is showing good progress, he said.

The Pennsylvania Health Council works closely with the Secretary of Health and the Advisory Board of Health. It is fostering the local health unit plan in communities by education programs.

In Pennsylvania 78.4 percent of the population are covered by five

Blue Cross plans, the Intercounty plan, and commercial carriers against hospital costs. A Blue Shield plan is State-wide in activity and growing rapidly in membership.

"Health education is the prime step in making the citizens health conscious, and it is only when they become health conscious that we get real support in projects for prevention of illness," concluded Dr. Engel. "The educational job with the public is monumental and never ending as new generations are born."

Rural Health Progress Noted in Virginia

Growing out of the need of rural people for more adequate medical services, the Virginia Council on Health and Medical Care has stimulated health progress in Virginia since its beginning in 1946, Edgar J. Fisher, Jr., director, told the Conference for Health Council Work.

Mr. Fisher listed many accomplishments. The council, he told the conference, has:

Spearheaded and promoted an over-all health program with emphasis on coverage of the State with public health services. Now 91 of the 98 counties have full- or part-time health officers.

Centered attention on the mentally

ill in State mental hospitals. Institutions are becoming hospitals.

Taken the initiative in getting acceptance of the Hill-Burton hospital program, hospitalization of the indigent, and the regional hospital plan through which interns from the two medical schools are rotated to seven hospitals in the State.

Assisted Negro hospitals in meeting American Medical Association standards for approved internships.

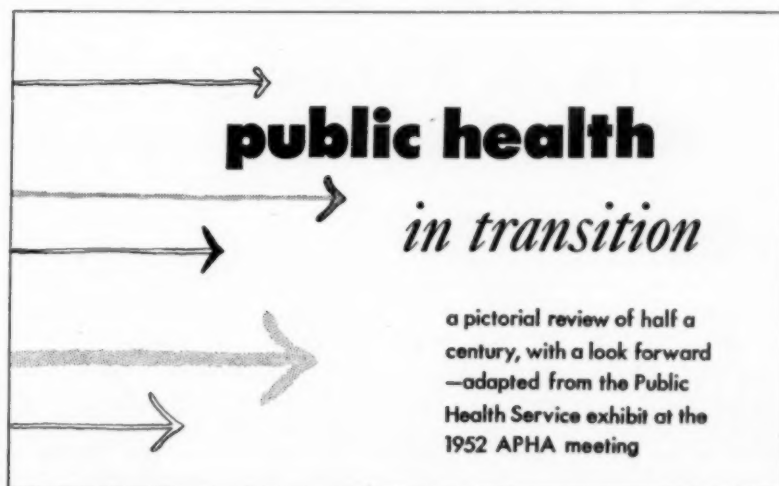
Worked for tuberculosis and cancer control, transforming beds in sanatoriums from pavilion to hospital type and establishing 11 tumor clinics.

Supported programs for medical, dental, and nursing scholarships (50, 4, 74, respectively) offered alike to white persons and Negroes. Doctors pledge a year of rural practice for each year of scholarship.

Aided medical colleges in improving facilities for training health personnel; encouraged teacher training institutions to build adequate health curriculums.

Recognized the need for recruitment of medical auxiliary personnel, beginning at the high school level, and adequate salary schedules to make recruitment possible.

Inaugurated a nationally recognized physician placement service administered by the council to encourage doctors to settle in rural areas.



Sponsored a conference for workers with handicapped children as a result of which the Nemours Foundation has granted a substantial sum for strengthening the program.

Helped local health councils get started and interested the nutrition council in becoming a standing committee of the health council.

Health Programs Depend On Citizen Participation

Health councils are formal expressions of the trend by which public health has become a community endeavor and has ceased to be the exclusive domain of professionals, Harald M. Graning, M.D., regional medical director, Federal Security Agency, Region V, Public Health Service, told a joint session with the Conference for Health Council Work.

Public health has broadened from the control of contagious diseases to treatment of delinquency, mental and emotional disturbances, ills of the aging, obesity, and alcoholism, Dr. Graning remarked. The expansion of health planning is observed

in such national programs as that on aging, he noted. Medical research and medical treatment are the core of any planning, but the aging program's broad sociological scope takes it "beyond the embrace of medicine," he said.

Dr. Graning said that the consequences of the decreases in communicable diseases are to be seen everywhere and noted that the professional, the specialist, and the laboratory isolate are more and more sharing the field with those who practice where medicine allies itself with the social sciences. The effect is to think in broad concepts rather than specific disease entities when planning the integration of local, State, and national programs, he believes.

Council's Impact

Conquest of the social problems of disease depends to a major degree on community participation in health services, the regional medical director stated. There is a practical value in selecting members of the community for service on health councils, for they are often in a much better position than professional or official members to see a

program in its entirety and to identify any lack of balance or excess emphasis on professional specializations, he advised. Citizens with executive capacity and budget experience or with knowledge of resources and relative needs in program fields and welfare areas could increase the competency of a health council in fiscal and budget matters, Dr. Graning said.

"Participation in a health council by nonmedical members of the community may be vital in recalling the professional to the felt needs of the community which may be quite different from what he imagines them to be or perhaps even wants them to be," Dr. Graning asserted.

The effectiveness of health councils will be multiplied by their gaining acceptance before legislative committees or budget groups prior to decisions which may mean the life or death of a program. Many councils have permanent committees on legislation to analyze Federal, State, and local legislation affecting health programs. "If there is any more important job than this, which a council or its legislative committee can do, in relating its own plans to other health programming, I do not know what it is," said Dr. Graning.

New Research, Service Roles For the Bacteriologist

The increasing development of antibiotics and their widespread use is creating new problems for, and laying new responsibilities upon, the bacteriologist and his laboratory. But these are only a few of the newer and expanding areas of activity in which the laboratory figures, as shown by review of the many papers and discussions presented before the APHA laboratory section and related groups.

Laboratory Has Share In Therapy Guidance

The introduction of new antimicrobial agents has caused a shift in the responsibility incumbent upon the bacteriologist, said Frederick C. Fink, Ph.D., coordinator in the

hospital laboratory advisory service of Chas. Pfizer and Co., Inc., Brooklyn, N. Y.

The speaker based his remarks on the antibiotics conferences held in 100 large cities in this country and Canada at which antibiotic testing authorities discussed the observations made in the bacteriology laboratories of medical schools, public health facilities and hospitals, and industry.

Mr. Fink pointed out that now the laboratory faces the tremendous problem of guidance for antibiotic therapy after the cause of infection is discovered by the clinician. In shared responsibility, the clinical-diagnostic laboratory and the industrial research facilities are develop-

ing assay techniques and sensitivity tests—reliable indexes to the therapeutic effectiveness of antibiotics, he said.

Historical Stage

The past 20-year history of laboratory bacteriology was divided by Mr. Fink into three stages: the pre-sulfonamide, the sulfonamide to penicillin, and the penicillin to "broad-spectrum" antibiotic (chloramphenicol, aureomycin, and terramycin). During the first stage, a bacteriology laboratory received clinical specimens, made and studied smears and cultures, and then made a report. With the etiologic agent thus identified, the clinician usually decided upon the course of therapy from among the palliative or specific curative drugs at hand.

Soon after the clinician and bacteriologist became aware that some cases did not respond to sulfonamide therapy, Mr. Fink continued, researchers developed in vitro sulfa sensitivity tests on pathogen isolates. Doctors then found that in vitro tests, using the entire family of available sulfonamides, saved much haphazard choosing of drugs to suppress infection.

Antibiotics

From the extension of the original work on penicillin came the antibiotics. Mr. Fink explained it was soon learned that many of the sulfa-resistant organisms were penicillin-sensitive and that many of the penicillin-resistant strains were sulfa-susceptible. Carefully performed laboratory sensitivity tests predict the response of organisms, Mr. Fink indicated. The broad-spectrum agents, bacitracin, polymyxin, streptomycin, and others, each with a slightly different spectrum of activity and varying degrees of toxicity, are used for routine check of microbial sensitivity in vitro.

Techniques in laboratories will continue to be determined by the mode of performance and the validity of conclusions, Mr. Fink said.

The ideal sought by scientists hinges on the care with which they select for adoption the newly described techniques of other workers, and the manner in which they approach and tackle original research problems.

Popular Tests

The three most popular techniques for in vitro testing, the broth dilution, the agar dilution, and the agar diffusion (disc-plated) methods, have in common six features which Mr. Fink lists as: inoculum; preparation and storage of antibiotic stock solutions; choice of diluent medium; pH of the medium; time and temperature of incubation; and interpretation of the tests.

"Whichever technique is adopted, it should definitely be standardized for that laboratory with respect to the inherent variables," he suggested. "We must more often rely upon information from the laboratory as we realize the existing response variation among species of the same genus or among strains of the same species."

Mr. Fink stressed that the only absolute criterion of success or failure in the use of one or another sensitivity testing technique is the clinical response of the patient following administration of adequate dosage of the agent indicated as "drug of choice."

Laundry Recontamination Hazards Emphasized

Laundry processes are efficient in removing bacteria from fabrics during washing, but the materials become recontaminated in the spin dryer or while hanging in the laundry to dry, reported Brooks D. Church, M.S., and Clayton G. Loosli, M.D., of the preventive medicine section, department of medicine, University of Chicago.


In an extensive bacteriological study in two laundries—one hospital and one commercial—it was found that during the sorting of linen and other activities the air became contaminated with bacteria and in turn contaminated clean woolen blankets and fabrics.

Also, airborne bacteria were drawn through the spin dryers and impinged on the washed textiles, and while large numbers of organisms were killed in ironing, many survived. One factor in survival, they stated, is the extraneous dried mucus covering the bacterial cell.

The findings in this study are of public health importance, they maintained, because the surviving organisms, mainly nonhemolytic and alpha streptococci and *Staphylococcus albus* and *S. aureus*, are all potential human pathogens. Clean

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linen which has been recontaminated in the laundry may be the source of serious infections in hospitals and military barracks.

Authorities should recognize the danger of recontamination of washed bedding by airborne bacteria dispersed while sorting and handling unwashed linen, they concluded, and should institute preventive measures by requiring proper construction, ventilation, and management of laundries, both hospital and commercial.

Solid Immunity Provided By Diphtheria Toxoid

A high level of immunity to diphtheria and tetanus can be induced in adults by small, properly spaced doses of precipitated diphtheria toxoid, Geoffrey Edsall, M.D., director of the Commission on Immunization, Armed Forces Epidemiological Board, Walter Reed Army Medical Center, and J. S. Altman, com-

mander, Medical Corps, United States Navy, reported.

In an investigation of diphtheria-tetanus immunity, 1 Lf-unit doses of precipitated or adsorbed diphtheria toxoid were given to 519 volunteer Navy Service School students, they stated. The first two doses were administered 3 weeks apart, the third, 5 months later. Antitoxin titers were determined before the first and third doses and after the third dose. After the third dose, they said, 250 of the 252 men who completed the study showed solid immunity.

Antibiotics Assayed By Serial Dilution

The application of antibiotic therapy for the control of infectious diseases necessitates the adaptation of antibiotic assay methods to routine

use, maintained Carolyn R. Falk, B.S., bacteriologist in the New York City Department of Health. In the past 9 years, the antibiotic testing unit of that department has tested more than 2,700 organisms for antibiotic sensitivity and over 10,000 body fluids for antibiotic level, Miss Falk reported.

The laboratory technique found to be the most practical for both tests is the test-tube twofold serial dilution method. It is easily mastered by the average technician, affords more quantitative results than the disc-plate method, and distinguishes between bacteriostatic and bacterial levels, Miss Falk stated.

She described the method briefly, pointing out that the tests for the new antibiotics follow essentially the same pattern as those for penicillin and streptomycin. In determining possible effective pairs of antibiotics, the scheme suggested by Jawett and co-workers is of assistance, Miss Falk said.

Experience With Home Care In Four Large Cities

Planned medical care at home offers striking promises of economy of operation and satisfaction for patients and relieves pressures on hospital occupancy, but many problems remain—particularly those involving the financing of services for the medically indigent.

These were among the main points presented before a joint session of the health officers, medical care, and public health nursing sections of the APHA, with the Conference for Health Council Work.

Boston's Voluntary Plan Has Financing Problem

Financing medical care for the medically indigent remains an unsolved problem for a voluntary project, Henry J. Bakst, M.D., indicated in a discussion of a home care pro-

gram that meets the dual purpose of serving the needy and providing a vehicle for medical education.

Dr. Bakst, professor of preventive medicine at the Boston University School of Medicine and director of home medical and out-patient services for the Massachusetts Memorial Hospitals, based his observations

largely upon the long experience of the two institutions. A home care program for the needy and medically needy has been a joint activity since 1875.

Public relief agencies financed by Federal, State, and local funds help the totally needy meet the cost of medical care, Dr. Bakst explained. But this group, he said, makes up only one-third of the annual patient load of the Boston home medical service, about 35 percent of the 15,173 home calls made in the 12 months from April 1950 to March 1951.

The Medically Needy

Two-thirds of the visits are made to the medically needy—persons who are able to provide for ordinary day-to-day needs but cannot meet medical costs, he said. Usually, nonofficial agencies, such as the hospital volunteering the service, must subsidize the medical care for this group, he stated.

Outlining the Boston program briefly, Dr. Bakst pointed out that eligibility for admission for out-patient treatment in the medical school-hospital program is based on an income limitation of \$40 a week for a single person. Groups of senior medical students provide the medical service under the supervision of two full-time second- and third-year residents and the staff of the department of preventive medicine. The service is supplied on request to eligible persons among the 50,000 in the square-mile area surrounding the hospital and school.

From November 1949 to October 1950, 84.23 percent of the patients were treated at home, 8.83 percent were referred to the out-patient department for further evaluation, and 6.94 percent were admitted to the hospital.

Six Basic Elements

Dr. Bakst named six requirements as essential to a home care program:

1. The services and resources of a general hospital.
2. Coordinated use of community resources such as the visiting nurse association, the health department, the family society, and other official and voluntary health and social agencies.
3. Centralized administration with emphasis on continuity of care and unit records.
4. Integrated cooperation of professional personnel—especially the physician, visiting, public health and school nurses, and the medical social worker—for consideration of the patient as a social being in his environmental setting.
5. Specific geographic area of responsibility in the larger cities.
6. Adequate financial support, with particular attention directed to the problem of medical indigency.

Dr. Bakst noted that hospitals participating in a home care program extend their services beyond the institution walls and add a real contribution to the health of the community. Such a program becomes, in part, the nerve and com-

munications center of personal health services for the community area, he said.

Hospital Stay and Costs Reduced by D. C. Project

Home care service for patients with long-term illness saves \$100 per patient by reducing hospital stay and costs of patient care, Sidney Shindell, M.D., in charge of the home care pilot study at Gallinger Municipal Hospital, Washington, D.C., told a joint session with the conference of Health Council Work.

The home care unit was set up as an independent administrative unit at Gallinger Hospital which treats indigent patients in cooperation with the District of Columbia Department of Health and Hospitals. Its purpose, Dr. Shindell said, was to determine: the nature of the eligible patient population; the effect of home care in reducing hospital stay costs; and the extent to which the program conserved the total number of beds. By a random selection, 177 eligible patients were divided into a study group and a control group. The control group was observed to determine what happened to such individuals using existing community facilities. Dr.

Shindell made the following points in his report.

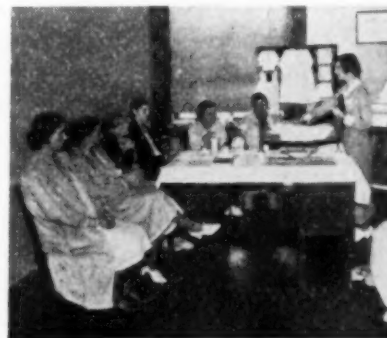
Potential Is 2.1 Percent

During the study, approximately 7,500 patients were admitted to Gallinger Hospital. Of this total, 5.5 percent were medically qualified for home care service, but two-thirds of these were disqualified because of inadequacies in the home situation. This is equivalent to a home care potential of but 2.1 percent of all admissions.

The home care patients averaged 17.2 days stay in the hospital, 24 days less than the patients in the control group. They received 118 days of home care. The cost of hospital care was approximately \$13.50 per day and of home care, \$3.70. Significant savings to the community accrued during the 24 days of home service; but the costs of the two groups paralleled each other upon the discharge of the control patient to his home with out-patient care.

Hospital beds made available by the use of home care service totaled 10 or an equivalent of 1.9 percent annual increase in available beds. The savings in bed availability, like the savings in cost of care to the community, would be increased if a larger proportion of medically suitable patients had adequate homes or if domiciliary facilities were available.

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Health Unit and College Give Richmond Service

Richmond, Va., now provides excellent medical and dental care for its indigent persons at a reasonable cost through the cooperation of the Richmond Health Department and the Medical College of Virginia.

This program was described by E. M. Holmes, Jr., M.D., M.P.H., director of public health, Richmond, and professor of community medicine, Medical College of Virginia; Kinloch Nelson, M.D., clinical director of home care service and director of continuation medicine, Medical College of Virginia; and Charles L. Harper, Jr., M.S.P.H., administrative assistant of medical aid bureau, Department of Public Health, Richmond.

In 1909, Richmond assumed responsibility to its indigents by a physicians' home visiting service as part of its over-all medical care program, the officials reported. Weaknesses in this service became so glaring that in 1947 the Richmond Area Community Council was asked to survey the problem. The recommendations resulted in a quality medical care program administered by the health department and using technical services provided by medical professors and students of the Medical College of Virginia. The medical care program begins with the onset of illness and continues to the restoration to economic usefulness or throughout chronic illness to death, they said.

Over 4,000 Patients

The officials described the gradual inclusion in the community service program of hospitalization, auxiliary medical services, sick-room loan chest, and rehabilitation counsel. During the past fiscal year 9,674 calls were made on 4,006 patients, an increase of one visit per patient over the old district physician arrangement.

The fiscal 1952 per capita cost of \$1.52 for this well-coordinated medical care program is considered ex-

tremely low, they stated. The city's budget for its entire medical care program, which includes emergency hospitalization, chronic illness care, nursing home care, dental care, outpatient clinics, and 80 percent of the home care cost, is \$350,600. The cost of the home care program is \$82,501.

Under Richmond's new medical care program, the same amount of money spent has produced a greater range and a greater volume of service, the officials noted. In the year 1948-49, the city provided 18,925 hospital days, but last year it provided 36,100 days for essentially the same amount of money. This high quality medical care at a reasonable expense to the taxpayer has been achieved by coordinating the activities of the many agencies involved, by utilizing the available resources most effectively, and by maintaining a close administrative control, they concluded.

Ward Occupancy Lowered In New York Facilities

The difference between ward occupancy rates of 101 percent in hospitals with home care programs and 117 percent if these hospitals had none "is the most eloquent indication of what home care programs mean to a hospital system operating under the pressures of the Department of Hospitals," stated Marcus D. Kogel, M.D., Commissioner of the Department of Hospitals of New York City before a joint session with the Conference on Health Council Work.

Beginning with 5 hospitals in 1948, he reported 16 now participating in the home care program providing nearly 350,000 home care days during the first 6 months of 1952, an average daily home care census of 1,907 patients. At the same time, 2,171,000 ward days were provided by the same hospitals, an average daily census of nearly 12,000.

The program's impact was illustrated by Dr. Kogel by the experience of the Harlem Hospital. The home

care service was set up reluctantly because of unfavorable housing facilities in the underprivileged neighborhood of the hospital. However, in the first 6 months of 1952, the home care census was 133 patients and the ward occupancy rate dropped to 124 percent from a high of 140 in 1949. This service now ranks fifth among the 16 programs.

Will and Leadership

"The Harlem Hospital experience demonstrates that it is quite possible to set up an effective home care service in any general hospital provided there is the will to do it and the dynamic leadership to guide it," stated Dr. Kogel.

The Department of Hospitals refers to home care as a continuation of hospital care in the patient's home—or a boarding or nursing home, Dr. Kogel pointed out. No patient is treated on a home care service without thorough hospital evaluation. One of the decisive medical factors determining eligibility for home care is the status of need of the patient for all of the medical facilities and services provided by a general care hospital; and if occasional medical supervision and nursing attendance can care for the patient.

16 Hospitals in Plan

Patients in general hospitals are the main users of home care services. Thirteen of the sixteen programs are associated with general hospitals. In addition, a chronic disease research hospital and two tuberculosis hospitals are operating such services. Chronic disease patients, however, make up the bulk of the cases.

Problems encountered in the program include the suitability of the patient's home, lack of housekeeping services in the home, and transportation. Another difficulty is getting support for the program from hospitals' attending staffs. Staff shortages have necessitated the cutting down on home visits by house staff members, Dr. Kogel reported, adding that Welfare Department panel

physicians or full-time physicians employed especially for visiting home care cases, have taken their place.

In spite of these difficulties Dr. Kogel feels that the "home care idea has given us in the Department of Hospitals a breathing space until modernization and replacement programs are completed and it has made a permanent place for itself in the scheme of hospital operation."

of filling immediate and direct patient needs. However, it proved to be excellent for teaching medical students, and made information about follow-up of cancer patients available to the tumor clinic staff teachers, Dr. Pfeiffer and Dr. Lemon reported.

The daily case load ranged from 1 to 11 patients, usually varying from 7 to 11; visits totaled 439, an average of 8 per patient before

death, hospitalization, or other disposition. Indigency varied from absolute, in terms of public assistance and hospital ratings, to partial financial lack. Occasionally a staff specialist referred a patient who was a suitable subject for teaching purposes. Ages of the patients were 21 to 90 years; average, 61 years; 84 percent over 50. Most women were between 50 and 61; the men between 60 and 79.

Terminal Cancer Patients Receive Home Care

Home care of indigent terminal cancer patients over a 2-year period made 676 hospital days available to persons with acute illness or chronic disease necessitating hospitalization, and saved the hospital \$12,000 as well.

These results of a study at the Hospital of the Woman's College of Pennsylvania, Philadelphia, to determine the feasibility and value of providing medical care for terminal cancer patients who could be cared for at home as well as, or better than, in a hospital bed were reported by Mildred C. J. Pfeiffer, M.D., M.P.H., director of the division of adult cardiovascular diseases, Pennsylvania Department of Health, and former director of the department of oncology of the Woman's College of Pennsylvania, and Eloise M. Lemon, M.D., fellow in oncology and clinical assistant in medicine at the college.

The need to continue the hospital's responsibility for medical management of indigent cancer patients was recognized by the Woman's Medical College shortly after establishment of a tumor clinic in September 1948, the physicians said.

Case Load

The medical social worker and the physician cooperated closely in selecting patients for the study, which was originally conceived as a method

Cancer Control Projects And Research Activities

That progress against cancer—in terms of control if not direct prevention—is possible was suggested in reports of current activities from Puerto Rico, Connecticut, and Massachusetts. At the same sessions of the Public Health Cancer Association and the epidemiology section, new data were presented on socioeconomic aspects, cancer detection, medical teaching, and the role of heredity.

90% of Cancer Patients Served in Puerto Rico

At least 90 percent of the cancer patients in Puerto Rico now receive diagnosis, treatment, or follow-up care through a cancer control pro-

gram of the Puerto Rican Government, reported Lyndon E. Lee, Jr., M.D., Roberto Fuentes, B.A., and Luisa Lefebvre, B.S., from the Puerto Rico Department of Health and the University. They predicted that a contemplated broadening of the program will insure the provi-

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sion of governmental aid to all cancer cases.

The cancer program was initiated in October 1949 when it became evident that the increasing public health problem of cancer among Puerto Ricans required an organized official control effort, the speaker stated.

Case Reporting

A statistical registry was established for the recording and analysis of pertinent data from all cancer cases in 72 hospitals. All physicians and hospitals were required by law to report to the Bureau of Cancer Control the details of any case diagnosed as cancer. Now pending are amendments to the law to require such reports from diagnostic and clinical laboratories, they said.

In considering immediately practicable steps to be taken, it was found that Puerto Rico's major difficulty in cancer service was a lack of personnel and facilities for microscopic examination of tissue. Consequently, an expert pathologist was retained to review and recommend solutions for the pathology problem, and additional equipment was provided for the broader functioning of a central pathology laboratory. It was noted that facilities for X-ray diagnosis and therapy also were increased and improved.

Cytology Center

Upon discovery that cancer of the cervix was the most frequently encountered condition, an intensified effort for early diagnosis of this type of cancer was promoted and a cytology center established. The initiation of a cooperative case-finding program for lung cancer produced gratifying results, they noted.

Educational aspects of the program, the Puerto Rican group reported, included distribution of a cancer manual to general practitioners and, in order to obtain uniformity in reporting, a "Manual of Tumor Nomenclature and Coding" to pathologists and hospitals. Weekly

tumor conferences for physicians were held at three major cancer centers and 10-week postgraduate courses, including lectures, clinics and operative demonstrations, were presented weekly in seven local areas by an itinerant instructor. Lectures also were given to ancillary medical groups and to lay organizations with mass education facilities.

At present, they continued, \$75,000 in service contracts for cancer diagnosis and treatment is allotted each year to two hospitals which care for 50 percent of Puerto Rico's cancer patients and an additional \$25,000 a year is divided among 11 other hospitals through a merit system of referral. This had made approximately 1,000 hospital beds available for cancer patients, but it was emphasized that such measures should be considered only as necessary, temporary expedients. They recommended construction in Puerto Rico of a central, government-supported cancer institute, devoted exclusively to the diagnosis and treatment of cancer patients and the investigation and teaching of all aspects of cancer.

Massachusetts Studying 24-Year Cancer Effort

The Massachusetts Department of Public Health has reappraised its cancer control program in a new series of studies on the effects of present day cancer control methods, reported Herbert L. Lombard, M.D., M.P.H., director of its Division of Cancer and Other Chronic Diseases. Cooperating in the study were Barbara Bennett, A.B., Barbara J. Drake, A.B., and Margaret E. Quinn, B.S., assistant biometricians.

The method of calculations and presentation of statistics on therapy used were the recommendations of the subcommittee of the World Health Organization. Records analyzed were those of 4,291 females with breast cancer who attended the

Massachusetts cancer clinics during 1927-50. Cases were classified in age groups, according to site of cancer originally diagnosed, and according to diagnosed or microscopically verified cancer, Dr. Lombard explained. From these data, tables and charts were prepared in all of the classifications for the computed rates of life expectancy for breast cancer admissions and for crude survival. Time period comparisons were made.

Survival Rate

In highlighting some of the findings, Dr. Lombard pointed out that the age-adjusted survival rate, corrected for deaths from causes other than breast cancer, probably gives one of the most representative pictures of the situation. The over-70 age group showed the greatest increase for the 5-, 10-, and 15-year survival periods; credit for this improvement is given to radical operations and better pre- and postoperative treatment. In earlier years, elderly persons with cancer were not usually treated by radical operation; now operations on 80-year-olds are not unusual.

The under 50 years of age group showed the highest percentage of cures as well as a larger percentage of highly malignant tumors. The high percentage of cures may be because the young have profited by their receptiveness to the educational programs in Massachusetts, he said.

Trends in breast cancer survival are upward, concluded Dr. Lombard, but further study is needed to determine all of the causative factors.

Patient, Physician Aided By State Cancer Register

A State-wide cancer record register is of practical value to the medical profession, the individual patient, and the community, as well as the public health worker, experience in Connecticut shows.

These benefits, all intermeshing, were discussed by Matthew H. Griswold, M.D., chief, and Earl S. Pollack, M.A., research statistician, division of cancer and other chronic diseases, Connecticut State Department of Health, before the Public Health Cancer Association.

The register, maintained by the State health department since 1935, contains histories of some 55,000 cancer patients treated in 31 of 36 general hospitals in the State, they reported.

Health Workers

From these histories the medical profession gets information on the extent of the cancer problem, the trends of cancer incidence and prevalence, methods of diagnosis, treatment and results, and survival time, the Connecticut officials indicated. The register also provides a starting point for special clinical investigations, which, in addition to providing valuable information, stimulate interest among the medical profession in evaluating the results of their work with cancer and also tend to improve reporting, they said.

Patients

The patient, in turn, benefits through better care as knowledge and interest in cancer increases, the officials indicated. But more directly, they said, the periodic follow-up system conducted as an integral part of the register assures the patient of adequate attention after treatment. The private patient is followed through the attending physician; the service case, by the tumor clinic. The information obtained for each case is recorded in the local register and forwarded upon request to the central register.

Research

The register is now being used in a study of environmental carcinogens, the officials reported. The records make it possible to select individuals who may have been exposed to carcinogens and to obtain

details of their various occupations. Analysis of the data should point toward specific hazards in specific industries as areas for further investigation, they pointed out.

Socioeconomic Factors In Female Cancer

A correlation between low socioeconomic status and cancer of the stomach was found for women, but not for men, implicating cultural factors as a cause, Edward M. Cohart, M.D., of the Department of Public Health, Yale University, said in reporting on part of a study conducted in New Haven.

The study was undertaken to determine if there was a correlation between cancer sites and socioeconomic status in the United States, as had been found in England and Denmark. A second phase of the study will attempt to trace the biologic factors responsible for the correlation, he said.

Records of 347 cases of stomach cancer in men and 263 cases in women between 1935 and 1948 in New Haven were obtained from the Cancer Register of the Connecticut State Department of Health, supplemented by death certificates. The cases were grouped in seven socioeconomic divisions and, more

broadly, in three socioeconomic regions, he explained.

A highly significant excess of observed to expected cases was found among women in the lowest of the three groups. No socioeconomic correlation was evident for men on this basis, Dr. Cohart asserted.

Better Cancer Teaching In Medical Schools

Most medical schools in the country have subscribed to a program of improved cancer teaching, Murray M. Copeland, M.D., director of the oncology department at Georgetown University Medical Center, Washington, D. C., told the Public Health Cancer Association.

The program of coordinated cancer teaching, recommended by the National Advisory Cancer Council, is based on the premise that the family physician is the pivotal figure in cancer control because he has the first opportunity to discover cancer, Dr. Copeland reported. Medical educators have agreed that medical training should offer every physician better opportunity to understand the cancer problem by instruction in early detection and treatment, he said.

Dr. Copeland called attention to the disparity between the proven



control
of biologicals

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good results cancer treatment can give and the less satisfactory cancer statistics actually obtained.

The work of local and national organizations has apparently stimulated more people to recognize cancer symptoms and to seek aid early, he said, with reference to the studies of the Memorial Hospital of New York City on cancer diagnosis delays. The 1946 data showed that in 32 percent of the cases, patients were responsible for delay in diagnosis; in 1923-30 this figure was 44.3 percent. In 1946 the physician was responsible for 27.8 percent of delayed diagnosis, in contrast to 17 percent in 1923-30.

Credits Coordinator

Dr. Copeland credited the "cancer coordinator" with being the one common denominator in the various medical school programs and for gaining for cancer instruction an improved place in curriculums. One main objective, he noted, has been to give students a comprehensive concept of neoplastic diseases by integrating cancer instruction in the general curriculum.

The cancer coordinator has stimulated the internist, surgeon, pathologist, and radiologist to participate in cancer teaching, usually through advisory cancer committees, Dr. Copeland said. He has broadened the concept of cancer as a disease worthy of special attention, urging its distinct, but not necessarily separate, identification, as a public health, therapeutic, and research problem.

The cancer coordinator has also influenced many schools to achieve better cancer facilities and services, he said. Twenty schools had started tumor clinics, and 39 additional schools had expanded or improved their cancer clinics in 1950. Many have enlarged on visual education materials, record systems, and follow-up services. And 31 schools have undertaken clinical research, bringing the departments of medicine more actively into the cancer teaching program, Dr. Copeland concluded.

Cancer Detection Service Aids Preventive Medicine

In fulfilling its main objective of finding cancer cases, a cancer detection center otherwise serves the cause of preventive medicine by discovering many other pathological conditions and referring them for treatment.

Emerson Day, M.D., Thomas G. Rigney, M.D., and Dorothy Fahs Beck, Ph.D., of the department of public health and preventive medicine, Cornell University Medical College, drew this conclusion from analysis of 2,111 initial examinations of adults at the Kips Bay-Yorkville Cancer Detection Center.

The project was set up by the Cornell Medical College and the New York City Department of Health to study the role of cancer detection in adult health services and preventive medicine.

The findings revealed that 27 of the 2,111 examinees had cancer even though the group had been pre-screened to exclude persons with symptoms suggesting malignancy. More than half of the 27 had no symptoms, and were "true detections."

Precaution Rewards

Precancerous neoplasms and other lesions requiring care as a precaution against cancer contributed an average of 14.3 diagnoses for each hundred examinees. Polyps of the colon and rectum constituted the largest component of the precancerous group.

The other pathological conditions found in a presumably well group were about nine times as numerous as cancer and precancerous lesions, and 65 per hundred of these required medical care.

Diagnosis of all types of conditions totaled 3,094, or an average of 1.5 per examinee. Of these, 66 percent were not previously known to the patient. Forty-seven percent of all examinees were referred for

medical care. Four out of five referrals were to private physicians.

Diagnoses Requested

Younger age groups sought the center's services more than did the older, but the latter produced more diagnoses of all types.

The investigators concluded that a cancer detection service diagnoses a small but individually important number of asymptomatic cancer cases and supplies the impetus for the study and treatment of conditions assumed to be precancerous. It detects many other conditions needing attention and initiates corrective measures and early treatment by referral of all types of conditions for medical care.

Suspect Hereditary Factors In Breast Cancer

Common hereditary factors rather than a common environment would be the logical explanation of the fact that breast cancer occurs approximately three times as often in relatives of persons who have had breast cancer than in relatives of those whose family history shows no mammary cancer, Madge T. Macklin, M.D., research associate and lecturer in medicine, Department of Medicine, Ohio State University, told the Public Health Cancer Association.

This does not mean that a woman will have breast cancer because her mother or sister had it, Dr. Macklin went on, but if she does develop the disease it is more likely to be in the breast than in any other organ.

A group of 272 women with breast cancer was interviewed, Dr. Macklin reported, to bring about data leading to these indications. Control groups included 200 women who matched age for age the cancer patients, and a group of 180 patients with cancer other than breast cancer. The study analyzed data obtained from familial histories, correspondence from living relatives, and death certificates and hospital records.

Laboratory and Epidemiological Reports From Overseas

Reports from laboratory investigators and epidemiologists from widely separated areas of the world—Korea, Australia, Costa Rica, Egypt—brought to the APHA meetings observations and data on a variety of diseases infrequently noted in the United States but always potential threats, directly or indirectly.

Salmonella and Shigella Cause Epidemic in Korea

In Korea for the first 5 months of 1951, *Shigella* and *Salmonella* infections were epidemic among the critically ill, starved, and wounded prisoners captured by United Nations forces late in 1950.

Lt. Col. Lorenz E. Zimmerman, MC, USA, Armed Forces Institute of Pathology, Washington, D. C., who was with the 8217th Mobile Laboratory in Pusan at that time, said *Salmonella* infections produced a larger variety of clinical manifestations, and *S. paratyphi* was the predominating *Salmonella* type. Two dramatic manifestations of salmonellosis believed to be rarely, if ever, encountered in the United States were reported by Dr. Zimmerman.

Paratyphoid Ulcers

The first—acute perforation of an ileal ulcer and absence of significant bleeding among patients with paratyphoid fever—occurred in epidemic proportion. Surgical exploration was performed on over 200 patients because of signs of peritonitis incident to intestinal perforation. *S. paratyphi* were consistently recovered in the culture studies that were possible, he said.

Dr. Zimmerman attributed the low incidence of positive results partly to the unavailability of many surgical specimens until 36 hours after operation. He found the paratyphoid ulcers to have certain distinct clinical, bacteriological, and anatomic differences from typhoid ulcers. He continued with the following observations:

Many patients were symptomatic and ambulatory or only mildly ill until the time of perforation. Of 98 with known duration of illness before perforation, only 31 had been sick for more than 6 days. About one-half had denied illness preceding perforation, a striking contrast to perforation of a typhoid ulcer, which usually occurs during the second or third week of illness. Massive gastrointestinal hemorrhage—the complication most feared in typhoid fever—was conspicuously absent. No instance of hemorrhage was found in over 30 autopsies on patients dying of peritonitis or of other manifestations of *Salmonella* infection.

Preliminary investigation established that the perforating paraty-

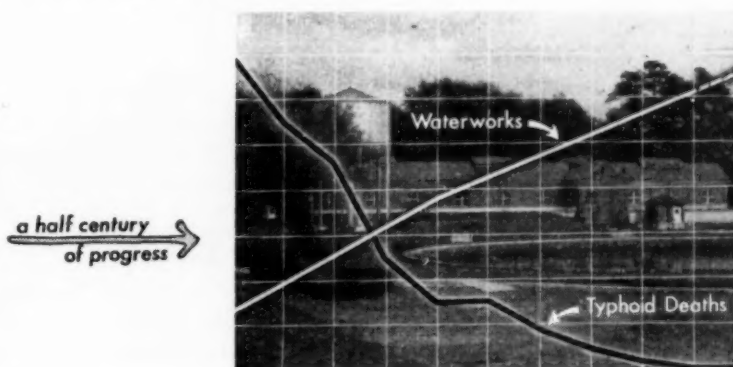
phoid ulcers, like typhoid ulcers, occurred in the lower ileum—73 percent within 30 cm. of the ileocecal valve. Multiple ulcers were more common than single ulcers. On gross examination, paratyphoid ulcers were distinctive and could be differentiated from those of typhoid fever. They were ovoid, usually narrow, often slit-like, and lay transversely between folds of mucous membrane on the antimesenteric border of the ileum. Some were shallow, involving only the surface mucosa, while others penetrated deeply, causing perforation. They were often more easily located by exploration for evidence of peritoneal action.

Salmonella Septicemia

The other unexpected clinical manifestation of especial epidemiological significance was demonstrated in the cases of two patients who, though treated successfully for relapsing fever with meparsen, succumbed to a concurrent *Salmonella enteritidis* septicemia. *Borrelia* could not be demonstrated, but *S. enteritidis* was recovered, on autopsy, from the blood, urine, bile, and spleen of the first, and from the blood and spleen of the second. The second case also revealed an acute bacterial endocarditis.

In the great European epidemic of 1920-22, mortality rates from *Salmonella* septicemia in relapsing fever

municipal sanitation



reached 63 percent. Abscesses, gangrene, chondritis, osteomyelitis, arthritis, and thrombophlebitis occurred in as high as 13.8 percent of the typhus and 3.4 percent of the relapsing fever cases. The 1937 findings of P. Y. Liu, S. H. Zia, and H. L. Chung showed that body lice obtained from patients indicated that *Salmonella* infection should be added to the list of louse-borne diseases.

It is important, Dr. Zimmerman felt, that the clinician recognize the therapeutic implications of the two concurrent infections since experience in Korea has shown chloramphenicol to be of value in both *Salmonella* and *Borrelia* infections.

By May 1951, most prisoners had been taught the basic elements of sanitary discipline; the malnourished had been well fed; and the wounded were recovering. These factors, combined with many others, brought the once serious epidemic under control.

Infect Australian Rabbits With Myxoma Virus

"In October 1951 I spent a night in a country hotel in northern Victoria and was intrigued to read a notice in the bar: 'An officer of the Lands Department will attend at the stockyards on Tuesday next to inoculate rabbits with myxomatosis. Landowners should bring 10-20 live rabbits.' That sort of thing went on over most of Australia," Sir F. MacFarlane Burnet, M.D., director of the Walter and Eliza Hall Institute of Research, Royal Melbourne Hospital in Victoria, Australia, told APHA epidemiologists.

Sir MacFarlane outlined the rabbit's significance to Australia before telling the epidemiology story of the dissemination of myxomatosis virus to effect biological control of the animal.

"Our rabbit is the European species that is found wild in England and is the ancestor of all the breeds of laboratory rabbits," he said. In-

troduced by homesick colonists around 1860, it spread from Victoria and New South Wales until rabbit colonization of the land was completed about 1930. Between 1 and 3 billion rabbits flourish in all the settled country below the tropics, spreading to arid areas according to seasonal conditions. Ten rabbits consume as much pasture as one sheep—a conservative estimate.

Elimination a Necessity

"The elimination of the rabbit would be by far the most effective single step to increase food and wool production," he stressed. The rabbit destroys natural vegetation in the marginal zone, causing wind erosion and sand drift. Once rabbits were recognized as serious pests, rewards were open for ways of exterminating them.

The Australian physician mentioned Pasteur's interest in the 1880's when the latter sent one of his men to Australia with *Pasteurella* cultures, but owing to the understandable skepticism of government officials he was not allowed to liberate the cultures. The possible use of myxoma virus was mentioned at various times, Sir MacFarlane said, and the first objective experiments dealing with Australian rabbits began in England in 1934. Investigations were moved to Australia when it became apparent that myxomatosis had no significant power to infect any other common animal.

It took 15 years more before the virus was effectively liberated, he said, because of "the rather illogical aversion of health authorities to allow field studies of the virus in any but sparsely populated areas, and the failure to grasp the importance of mosquito vectors for the spread of the disease."

Mosquitoes Are Vectors

In prewar field tests, one on an island off the South Australian coast, another in a dry inland area, he reported, "mosquitoes were inconspicuous or absent, and only a very

limited spread of the virus occurred."

When experiments were resumed in 1950, tests were made in higher rainfall zones in eastern Australia. Infection was mainly by contact, it was believed. Tests were made in the autumn, winter, and spring, but only a few local infections were observed.

Uncertainty existed as to how the virus spread in nature. The Australians had missed Aragao's work in 1942 on the natural history of myxomatosis in Brazil, and the realization that effective spread in Australia needed mosquito carriage came as a surprise.

In November 1950, Sir MacFarlane continued, the testing team was prepared to report a fruitless experiment. Then, word came in early December that rabbits were dying by hundreds along the Murray River flats near Balldale, where the liberations had been made. "This was front-page news for Australia, and everyone in the country was on the lookout for sick rabbits." The disease spread rapidly across New South Wales, reaching southern Queensland in 3 to 4 months—by the end of the Australian summer.

Evidence pointed to *Culex annulirostris* as the important vector. According to Sir MacFarlane, this very common mosquito breeds in shallow water at the edges of streams and in temporarily flooded regions. "It has a restricted flight range," he explained, "rarely moving as far as half a mile from its breeding place. The cross-country leaps of a thousand miles in 3 months could not have been due to this species, and there are a number of rival hypotheses to account for it—*Aedes theobaldi*, wind, human transport of mosquitoes in vehicles of one sort or another."

Inoculations

Commenting on the artificial dissemination of the virus, Sir MacFarlane said: "It is hard to be sure that the inoculations made any significant difference to the result."

The following summer, one with normal rainfall, saw the development of *Anopheles annulipes* as another important vector.

The virus investigations of Frank John Fenner, M.D., and his Melbourne colleagues may have general epidemiological significance, the speaker said. Studies show that myxomatosis is a member of the pox virus group. Field observations confirmed that vectors of myxomatosis need not be specific. The mosquito becomes infective for rabbits only by feeding through myxomatous lesions of the skin, resulting in mechanical contamination of the insect's mouth parts, and transfer to other rabbits is through a local lesion in the skin, not by injection of infected saliva into the blood. Any biting or sucking arthropod which feeds through the skin should serve. The role of the mosquito is merely that of a "flying pin," a phrase coined when Dr. Fenner discovered he could closely parallel his findings with mosquitoes by using an entomological pin pricked with a myxoma lesion.

"In myxomatosis, now by human action enzootic among Australian rabbits, we have a unique opportunity to watch a 'new' disease," Sir MacFarlane concluded. "I shall be surprised if the results do not eventually help us greatly in understanding some aspects of the past and present behavior of infectious disease in man."

Antibody Patterns Higher In Egypt Than Miami

Most Egyptian natives develop poliomyelitis antibodies in infancy and early childhood in contrast to the much slower and later antibody development found in Miami, Fla., residents.

This geographic and socioeconomic antibody pattern, possibly attributable to differences in living conditions, were reported by S. J. Liao, M.D., J. L. Melnick, Ph.D., and

J. R. Paul, M.D., of the section of preventive medicine, Yale University School of Medicine.

More than 60 percent of the infants tested in Cairo, Egypt, showed evidence of maternal antibody in the first 6 months of life, the investigators found. They lost this evidence of immunity during the second 6 months and reacquired it at the age of about 18 months. By age 5 most Cairo children had appreciable amounts of antibody.

Similar Patterns Found

A similar antibody pattern for poliomyelitis was found in the other crowded and low sanitation areas of Havana, Cuba, and the Latin-American areas in the Lower Rio Grande Valley of Texas, the investigators reported.

Serologic tests on Miami residents presented a different picture, they said. While about 40 percent of the newborn infants tested had poliomyelitis antibody, only 10 percent had reacquired the antibody at ages 5 to 9 years. The increase was slow: 50 percent had developed antibody at 5 to 9 years, and more than 80 percent in their 20's.

A child of 2 years in Cairo has an antibody development equivalent to that of a 15-year-old in Miami, the investigators stated.

They reported less marked differ-

ence in the Cairo and Miami antibody pattern for mumps. In both populations the proportion of persons with positive complement fixation tests rose rather slowly in the younger age groups. And in both areas, only 75 percent of the adult population was positive. This level of immunity to mumps was reached by 10 years of age in Cairo and by 15 years in Miami, they said.

Epidemic Hemorrhagic Fever Studied by Army

Epidemic hemorrhagic fever was first experienced by Americans last year in Korea, where it is now under intensive Army study, commented Joseph E. Smadel, M.D., chief of the department of virus and rickettsial diseases, Army Medical Service Graduate School, Walter Reed Army Medical Center, Washington, D. C.

A "place" disease—not a contagious disease—and unknown to Korea prior to this time, epidemic hemorrhagic fever was the subject of Japanese and Russian studies in Manchuria and Siberia during the last two decades, Dr. Smadel said in reviewing the etiology and epidemiology of the disease.

"There were approximately 1,000 cases of this disease during 1951 and about 700 cases since then. Such

the attack on nutritional diseases



a half century
of progress →

an incidence of a serious disease always constitutes an important military problem," he stated.

Dr. Smadel reviewed the information on the disease which has been accumulated in a brief time. He described the epidemic area in Korea as a belt extending across the peninsula from Seoul to the present main line of resistance, with sharply defined foci in rural areas. "Most cases occur as isolated events, but small outbreaks are encountered which appear to result from almost simultaneous infection of the members of the group," he said.

Etiological Agent

According to Dr. Smadel, both the Japanese and Russian scientists believed that the etiological agent was maintained in nature through a cycle involving rodents and arthropods, but the two groups were inclined to incriminate different rodents and different arthropods.

The American studies during the past summer produced similar opinions regarding rodents and arthropods. Their findings, however, pointed to trombiculid mites as the likely vectors, he said, adding that this general group of mites provides the vector for scrub typhus, another classic example of a "place" disease.

Dr. Smadel emphasized that definitive information on the mode of transmitting epidemic hemorrhagic fever to man and the natural cycle of the disease in rodents and arthropods will not be obtained until the agent can be readily handled in the laboratory and used in crucial tests.

There are many lines of investigation which hinge upon the theoretically simple procedure of finding a suitable laboratory host for the agent, he said. Both the Russian and Japanese researchers demonstrated that the disease agent was filterable and could be transmitted from man to man by inoculation of body fluids obtained during the first few days of the febrile illness, but were not able to establish and maintain the agent in a common laboratory animal.

"Since the disease was first encountered among United Nations troops, extensive and laborious efforts have been made to find the answer to the crucial question of a suitable laboratory host," Dr. Smadel reported, adding that as yet these efforts were not successful.

Wild Birds May Carry Encephalitis Virus

The hypothesis that the appearance of the encephalitis virus in temperate regions during the summer may be due to bird migrations, was presented by Sir F. MacFarlane Burnet, M.D., of the Walter and Eliza Hall Institute of Medical Research, Melbourne, Australia.

In discussing Murray Valley encephalitis, the speaker compared four severe epidemics which occurred in Australia during the years 1917, 1918, 1925, and 1951. He said studies indicate that the epidemics occurring in Australia differ only in detail from the epidemics of Kern County, Calif., and Yakima, Wash.

"What I have in mind is the possibility that persistence of these viruses in nature is confined to tropical or near tropical areas where mosquitoes capable of transmitting the virus are present all year," he said. Then, he depicted a bird in the stage of transient viraemia moving toward a temperate region, being bitten by and thus infecting several mosquitoes, which a week later infect another migrating susceptible bird. The second bird, continuing its flight, develops viraemia a hundred miles further away from the tropic and initiates another focus of infected mosquitoes. The presence of nesting birds in any locality so infected would soon build up a high infective potential.

"This is at present speculation, but it does provide a working hypothesis to account for the main features of the disease as seen in Australia, and just possibly, it may be

equally applicable to conditions in other parts of the world," Dr. Burnet said.

Serologic Survey

The findings of an extensive serologic survey in the epidemic area of the Murray-Darling River Basin led to Sir MacFarlane's hypothesis. In the summer of 1951 a large proportion of the population, the horses, dogs, domestic fowl, and wild birds, particularly water birds, showed serologic evidence of encephalitis infection. In 1952, the virus had vanished from the area, the speaker said.

Conditions in the area did not permit the virus to survive over winter, Sir MacFarlane concluded. He surmised that encephalitis "is not endemic in the Murray Valley, but reaches it from some other region only when climatic and ecological conditions are appropriate."

The abnormally heavy rainfall over the subtropical headwaters of the Darling River that preceded each epidemic in the area supplied a possible clue to the differences in the seasonal variations of encephalitis in the regions further north since the infection is common in tropical Australia.

While it has not been proved that Murray Valley encephalitis is spread by mosquitoes, Sir MacFarlane said, circumstantial evidence implicates as the principal vector the *Culex annulirostris*, a river bottom mosquito that feeds freely on water birds and rabbits, and indicates that wild birds are the main vertebrate host of the MVE virus.

A Barrier Zone Required For Sylvan Yellow Fever

The only hope of arresting the progress of sylvan yellow fever in Central America is to establish a barrier zone with effective insecticides and adequate control studies in a small terrain funnel between the

present location of the disease and its future zones of activity. Whatever the results, "we shall have learned much more for having made the effort, but if no attempt is made to establish this barrier zone . . . the grim mechanism will continue to advance unchallenged . . . and we shall remain merely the spectators in a great drama of our era." So Col. Norman W. Elton, MC, USA, director of the board of health laboratory, Health Bureau, Canal Zone Government, Ancon, C. Z., reported.

Pattern of Progress

Continuing his reports made earlier this year (one of which was published in the May issue of *Public Health Reports*), Colonel Elton made the following points:

In Central America the current sylvan yellow fever wave will move steadily northward through Nicaragua and Honduras and then north and west.

To deal with the disease effectively and to prevent needless confusion, a concerted effort has been made to determine its progress pattern and to maintain close contact with its activity. The wave has progressed approximately 13 miles per month although this might increase to 100 miles, he said, and incompletely controlled epidemic centers remain active up to about 2 months.

Types of Barriers

Open, deforested country and regions of minimal precipitation are barriers to the spread of yellow fever. The continental divide is not in itself a natural barrier. It was effective in Panama, west of the Canal Zone, but in Costa Rica, although higher than in Panama, it has been crossed in two localities. Further study is needed of the significance of rain forest continuity across the divide, similarities and differences in rainfall on the two sides, migrant farmers, and the various species of *Haemagogus* mosquitoes other than *spegazzinii* falco, as well as other canopy mosquitoes, as possible vectors at higher altitudes.

Working Links Between Hospital, Private, State Laboratories

Relationships between State public health laboratories and private and hospital laboratories were variously described as consultation, reference, evaluation, regulation, stimulation during a panel discussion sponsored by the Conference of State and Provincial Public Health Laboratory Directors. Reports were heard from three State laboratories, a private laboratory, and a hospital laboratory.

State Interest Encourages Private Laboratories

State departments of health should supervise, evaluate, regulate, and stimulate the expansion of privately operated laboratories in order to promote laboratory services which are uniformly ethical, adequate, and accurate, declared Albert Dickman, Ph.D., director of the Dickman Laboratories in Philadelphia, in the panel discussion.

Because of rapid and continuing advances in the medical sciences, he continued, laboratory services and requirements are becoming increasingly technical and complex. As an example he cited the 125 determinations now commonly performed by various Pennsylvania laboratories.

In urging an integrated laboratory program which he felt would best serve the public interest, Dr. Dickman warned that delays in stabilizing the laboratory profession complicate an already serious situation and stressed the need for cooperation among three main laboratory groups.

Three Main Groups

First, the analytical-biochemical-biological laboratories, offering to the medical profession analytical services exclusively; second, the pathologist-directed clinico-pathological laboratories, handling customary requests and referrals from the analytical laboratories and offering to the medical profession additional consultation, interpretation and diagnosis; and third, the public health

serology and chemotherapy

vs.
VD

a half century
of progress →



and reference laboratories, offering services for the indigent, analytical procedures beyond the scope of the other laboratories, and dealing primarily with the laboratory aspects of communicable disease and broad public health problems.

Dr. Dickman felt that a clear differentiation of the analytical-biochemical-biological laboratories and the clinico-pathological laboratories would eliminate the obstructions which in the past have prevented a cooperative solution of many laboratory problems.

He said that during the first 10 months of State health department supervision and licensing of laboratories in Pennsylvania—exclusive of hospital, governmental, and physicians' laboratories—many of the laboratories enlarged their accommodations, others installed new and modern equipment, and many directors attended meetings specifically arranged for study, discussion, and demonstration of modern procedures. Also, many were stimulated to initiate their own periodic evaluations of their services in anticipation of those to follow from the State.

Dr. Dickman expressed the hope that eventually the State department of health laboratory can become an educational institution for all the laboratories of the State, training suitable personnel, providing proper evaluation of techniques, and assisting in obtaining materials and reagents of adequate purity and reliability.

Consultation, Reference, Evaluation in California

The working relationship between the State public health laboratory and local clinical laboratories in California has become one of consultation, reference, and evaluation, Howard L. Bodily, Ph.D., acting chief of the division of laboratories, California Department of Public Health, told the Conference of State

and Provincial Public Health Laboratory Directors.

This relationship began in 1927, he said, when laboratory technicians began a voluntary certification program in cooperation with the State health department. The clinical laboratory law, passed in 1938, provided for licensure of laboratory technicians and nonmedical laboratory directors, or technologists, he continued. It prohibited performance of laboratory tests by anyone except technicians, technologists, and physicians or surgeons licensed in California, and limited direction of laboratories to licensed technologists and California licensed physicians and surgeons.

The State board of health, through the division of laboratories of the health department and two advisory committees, administers this law. It was recently amended to require a permit to operate a laboratory, as well as approval of laboratories and schools which train technicians, Dr. Bodily stated.

In addition to the two major committees, special committees assist in determining the part to be taken by the State public health laboratory in Rh determination, and in blood bank and similar activities, he said.

Administrative Links "Making Us Friends"

The administrative relationship between the bureau of laboratories of the Pennsylvania Department of Health and the hospital and private laboratories has "made us acquainted" and the service relationship "is making us friends," C. J. Gentzkow, M.D., director of the bureau, told the panel.

The administrative relationship originates in the laws and in the regulations issued under them, such as the law requiring premarital and prenatal serologic tests for syphilis (STS), said Dr. Gentzkow. Applications of laboratories for approval are reviewed by the health depart-

ment and the Advisory Committee on Laboratory Procedures. If the application is approved, serum specimens are sent to the laboratory and its performance is evaluated from the results of the tests. Quality of performance is evaluated regularly.

The value of the relationship under this act is evidenced by the general improvement in performance of the STS in approved laboratories, Dr. Gentzkow reported. Failures to turn in a satisfactory performance have decreased from 23 percent in 1950 to 9 percent in 1952. "Our laboratories feel free to call on us for assistance at any time," he said.

The passage of the so-called Analytical-Biochemical-Biological Laboratory Act in 1951 brought about a new administrative relationship between State laboratories and "certain laboratories making examinations of materials originating in the human body," Dr. Gentzkow continued. The act makes provision for the department of health to investigate and inspect laboratories, to deny permits, and to revoke permits previously issued. "We are now getting acquainted with some 60-odd laboratories for the first time," Dr. Gentzkow reported. Contacts have been established which will lead to service-type relationships.

Service

The second relationship is one of mutual service, according to Dr. Gentzkow. The State laboratory works beyond the scope of local laboratories, and in turn can refer to the Communicable Disease Center and National Institutes of Health laboratories of the Public Health Service, as well as to the various departments of the University of Pennsylvania and its graduate school and to the Armed Forces Institute of Pathology.

Technical personnel from hospital and private laboratories are given refresher training for varying periods. Laboratory personnel from the entire State participated in one recent conference at the Pennsylvania State College, he said.

Laboratories throughout the State study reports of methodology advances and also carry on their own studies. "When improvements in techniques or new methods have been studied and prove worth while, they are made available to all our laboratories," said Dr. Gentzkow. Hospital and private laboratories in turn report anything new and promising that they may discover. "These service relationships . . . are growing. All of us are becoming increasingly aware of the fact . . . we are mutually interdependent."

Comparative Proficiency Ratings Use Suggested

State public health laboratories should function as reference laboratories for private and hospital laboratories, J. V. Irons, Sc.D., director of laboratories, Texas State Department of Health, told the conference of Laboratory Directors.

They provide services useful in the prevention, recognition, and control of communicable diseases of public health importance, he noted. Nearly all perform bacteriological and serologic tests; most offer sanitary bacteriology and chemistry services; but few offer extensive diagnostic services in either medical mycology or virology. They do not generally perform clinical laboratory tests, which are the primary concern of the private and hospital laboratories. There is a growing need, he said, for the State laboratories to add some clinical tests "to meet the challenge of chronic diseases and diseases of old age."

In addition, the State laboratories should provide opportunities for refresher or specialized training of qualified personnel from private and hospital laboratories. They can also inspire confidence in the work of the private and hospital laboratories by evaluation of their services. He recommended the use of comparative proficiency ratings to detect deficiencies.

Prevention of Poliomyelitis With Gamma Globulin and Vaccine

Two advances in the search for preventive measures against poliomyelitis were reported at the Cleveland APHA meeting. William McD. Hammon, M.D., Dr. P.H., professor of epidemiology of the University of Pittsburgh Graduate School of Public Health, gave preliminary results of mass gamma globulin trials. Howard A. Howe, M.D., adjunct professor of epidemiology at the Johns Hopkins University School of Hygiene and Public Health, reported on use of a killed virus vaccine in six children.

through the fifth week, at least, Dr. Hammon reported.

The tests took place during epidemic outbreaks in Provo, Utah (September 1951), and in Houston, Tex., and Sioux City, Iowa (July 1952). The gamma globulin was processed from blood collected during World War II by the American National Red Cross and contained in approximately equal amounts antibodies against Brunhilde, Lansing, and Leon types.

Preliminary findings based on clinical diagnoses were summarized by Dr. Hammon as follows:

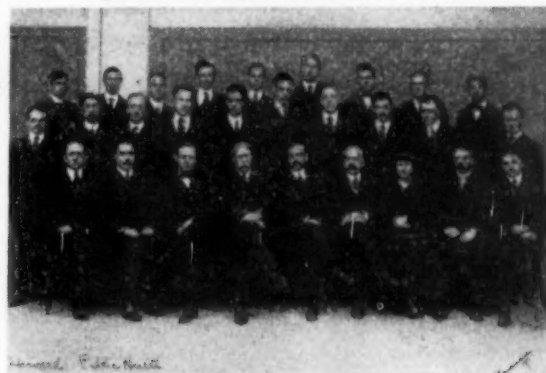
" . . . 54,772 children between the ages of 1 and 11 years were inoculated, one-half of them with gamma globulin and one-half with a solution of gelatin. These three field tests were conducted in areas that were experiencing severe epidemics of poliomyelitis. The injections were given to apparently normal, healthy children living in the area, with the full understanding, permission, and cooperation of the parents. Which of the two materials any one child had received was unknown to all—

Report Marked Protection In Gamma Globulin Test

Field tests involving some 55,000 children in 3 epidemic areas indicates that injections of gamma globulin containing antibodies against the 3 known poliomyelitis viruses gave marked protection that lasted

graduate professional education

a half century
of progress →



Harvard-MIT 1917 class, with Sedgwick and Rosenau

children, parents, and investigators—until completion of a follow-up period considered to be adequate for determining a final diagnosis.

Protection Demonstrated

"A preliminary tabulation of results as of October 1, 1952, shows that paralytic poliomyelitis had been diagnosed in 90 cases in the study groups. Analysis of these patients on the basis of the type of injection received shows that significant protection was conferred by the gamma globulin. During the first week after injection there was no significant reduction in the number of cases in the group receiving gamma globulin, but the severity of paralysis appears to have been modified. From the second through the fifth weeks highly significant protection was demonstrated. After the fifth week this was less evident, but more definite conclusions regarding the duration of the protection and possible modification of disease should be available after a longer period of follow-up. Laboratory studies, still incomplete, should give information regarding the effect of gamma globulin on inapparent infection and the subsequent development of active immunity."

The report—from which the above is taken—was read before the epidemiology and laboratory sections on October 22. Together with two other papers, one giving the plan of controlled field tests and the results of the 1951 pilot study in Utah, and the other outlining the conduct and early follow-up of the 1952 Texas and Iowa-Nebraska studies, it was published in full in the *Journal of the American Medical Association* for October 25, 1952, pages 739-760.

In Trial Stage

Looking ahead, Dr. Hammon said that "if it is found that gamma globulin has not interfered with inapparent infection and the development of active immunity during the period of protection against clinical disease, this agent will have a wide field of usefulness, at least until a

more effective and equally safe means of prevention has been developed."

"The present supply of the blood fraction suitable for poliomyelitis prevention use is extremely limited and completely inadequate to meet expected needs," Dr. Hammon said. Since World War II, he pointed out, there has been a sharp decline in public blood donations. However, he noted, the most heartening aspect of the situation is the willingness of the public to cooperate in the solution of a public health problem, as demonstrated by their participation in the field trials.

Associated with Dr. Hammon in the conduct of the field studies and as co-authors of the reports were Dr. Lewis L. Coriell of the Camden (N. J.) Municipal Hospital, Dr. Paul F. Wehrle of the U. S. Public Health Service, Dr. Christian R. Klimt, fellow of the Rockefeller Foundation, and Dr. Joseph Stokes, Jr., of the Children's Hospital in Philadelphia and of the University of Pennsylvania. The work was supported by the National Foundation for Infantile Paralysis.

Six Children Respond To Polio Vaccine

A satisfactory antibody in humans to killed poliomyelitis virus was reported by Dr. Howe in an exhibit at the meeting. Tests of six children in Baltimore showed antibody levels to the Lansing, Leon, and Brunhilde viruses comparable to levels found in vaccinated laboratory chimpanzees.

The vaccine, prepared from formalin-treated virus, is the result of studies over nearly 10 years on monkeys and chimpanzees which have shown conclusively that it is possible to immunize the animals against all types of the disease even when they are "challenged" by injection of active virus directly into the brain.

The children tested were between 2 and 5 years of age. All are inmates of the Rosewood Training School, a Maryland state-operated institution for the mentally retarded. They were chosen for the study because of their isolation from most outside contacts and the fact that they could be kept under continuous observation. Five ward mates of the children under study were not vaccinated and served as controls.

Written permission was obtained from the parents or guardian of each child for the studies, which were conducted with the cooperation of physicians and officials of the Maryland Department of Mental Hygiene.

Although Dr. Howe expressed his satisfaction with the results of the tests, he cautioned that the vaccine used is experimental and that more extensive laboratory work would be necessary before an effective and practical vaccine could be made available for general use.

Many Unknowns

There are many "unknowns" still to be determined, he pointed out, and, undoubtedly, the present vaccine will undergo changes before it can be used on a large scale.

Such factors as exact amounts of antibody necessary to immunize, the length of time immunization levels remain effective, the elimination of substances in the vaccine which might cause side reactions, and new methods for growing the active virus on a large scale must be worked out in the laboratory, he declared.

The human immunization tests were made during the summer and fall of 1951. Blood samples from the six children were taken on June 26, 1951, and the first dose of vaccine administered by intramuscular injection the following day. Only a very small amount of vaccine was given. As an extra precaution, gamma globulin, a human blood derivative which provides a passive or short-term immunization and prevents paralysis by destroying active virus in the blood stream, was given at the same time.

Antibody Response

Fifteen weeks later a second and smaller "booster" injection of the vaccine was given. Blood tests to determine the antibody response were made at regular intervals over 6 months.

Response to the Lansing and Leon varieties of the disease was the highest, while that to the Brunhilde strain was poor. Nevertheless, the reaction of two children to the latter type was definite and consistent with the responses to the other types. This same finding was recorded also in the tests on chimpanzees, and Dr. Howe expressed confidence that a larger quantity of the vaccine would produce higher levels of response.

At no time have any of the children shown any apparent discomfort or any untoward local reaction to the vaccine. The children will be followed closely for an indefinite period to determine how long detectable antibody will remain. The work was supported by the National Foundation for Infantile Paralysis.

Polio Follow-Up Program Revised in New York

Periodic evaluation of long-term follow-up of poliomyelitis patients—and for other similar programs—results in more efficient and more economical operations and frequently in radical changes in focus and procedures, reported Helen M. Wallace, M.D., director of the bureau for handicapped children, Patricia Heely, R.N., director of the bureau of nursing, and Herbert Rich, senior statistician, all of the New York City Department of Health; and Margaret A. Losty, R.N., director of nursing service for the National Foundation for Infantile Paralysis.

Follow-up Care Analysis

They made an analysis of the follow-up care given to 1,523 poliomyelitis patients during 1949 in New York City. The program studied

had been set up in the 1940's and provided for a 2-year period of home visiting by public health nurses. The plan represented an agreement of opinions of medical leaders in the field, members of the health department, and the voluntary nursing agencies.

Analysis of the plan as it operated in 1949 revealed:

1. The same amount of home nursing supervision was given to the nonparalytic, and the bulbar and other paralytic types of patients.

2. The same amount of home nursing supervision for the period of follow-up was given to all patients regardless of their medical status at 3 months after onset of illness.

3. 1,200 or 10 percent of the home visits were made after the patient had been discharged medically.

4. Fifty-two percent of the non-paralytic school age children who might have been followed through the school health service were not seen by that service.

5. Other examples of wasted home visits were the multiple visits made while the patient was hospitalized or away at school.

6. In only 4 percent of the patients a subsequent or new paralysis was detected; almost all of these patients were under continuous and competent medical care.

7. In one-half of the nonparalytic group subsequent paralysis was de-

tected within 3 months after onset; one-third of the paralytic group developed new paralysis within 1 year after onset.

8. One-half of the paralytic patients under private medical care did not receive such care from a qualified specialist.

9. There is some evidence that physical therapy was continued beyond the period when it is usually considered productive.

Wallace and her colleagues observed that "had the data obtained through this study been available in 1949, and the follow-up plan revised accordingly, approximately 8,350 of the 12,437 public health nursing visits actually made by health department nurses alone might have been saved and made available for other patients."

Priorities Set

Priorities, the authors felt, must be established, and they suggested that these "would logically seem to be: the nonbulbar paralytic group; the bulbar paralytic group; and the nonparalytic group. Patients who are homebound because of paralysis should receive high priority. Existing programs, such as the school health and child health services, should be used to their maximum for follow-up of patients, rather than superimposing another service."

the health department in field and laboratory

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As a result of this study, the follow-up program has been revised, Dr. Wallace reported. A guide for visiting has been set up. The number and frequency of home visits will be based on the needs of the patient and his family, and will be determined by the public health nurse in consultation with the patient's physician. The nurse, of course, may call upon her supervisor and consultants in the field for guidance. The suggested priorities are established, the New York group said, and included is the principle of use of existing school health and child health services. It is recommended that nonparalytic patients generally be visited for a 3-month period, and paralytic patients for 1 year.

Wallace and colleagues reviewed, also, problems of referral to special-

ists, interchange of information between hospitals and community nursing services, and physical therapy. They pointed out that while this study resulted in revisions, "it should not be taken for granted that this . . . is the final answer. Undoubtedly, periodic reevaluations will result in further modifications." They reported that a similar study is under way concerning follow-up of children with cardiac handicaps.

Polio and Rabies Viruses Show No Cross Immunity

Contrary to recent news reports that rabies vaccination may protect man from poliomyelitis are the recent findings of two scientists from the medical research institute connected with the Michael Reese Hos-

pital in Chicago. In a series of three experiments using 200 Swiss mice, no evidence of cross immunity was found between the poliomyelitis virus and the rabies virus by Albert Milzer, M.D., and Freddie Nicholson, B.S.

Dr. Milzer, chief of the microbiology department of the institute, reported that immune Lansing anti-serum failed to neutralize the rabies virus, and hyperimmune rabies anti-serum did not neutralize the Lansing virus. In every experiment the vaccine or hyperimmune serum tested showed significant protection against homologous virus.

The researchers warned that rabies virus has the possible hazard of producing allergic encephalomyelitis in vaccinated individuals and that its use should be restricted to proven indications.

New Methods and Approaches In Laboratory Techniques

Laboratory procedures have been made easier by the achievements of research bacteriologists in Baltimore, in the Public Health Service Communicable Disease Center, and in the Chemical Corps at Camp Detrick.

The laboratory section heard reports covering recent studies on the re-use of streptococcus cells, population changes in Brucella cultures, the virulence of Corynebacterium diphtheriae, and the use of Clostridium sporogenes to indicate sterility in laboratory instruments.

Virulence Induced in Avirulent Bacilli

Additional data on the effect of bacteriophage to virulence in *Corynebacterium diphtheriae* were reported by Elizabeth I. Parsons, Sc.D., bacteriologist, Communicable Disease Center, Public Health Service, and Martin Frobisher, Sc.D.,

head of the bacteriology department, University of Georgia.

Reviewing literature, they noted that several investigators have shown that toxigenic strains of *C. diphtheriae* from cultures of avirulent *C. diphtheriae* developed from contact or infection with specific bacteriophage, repudiating the earlier theory that avirulent strains never acquire virulence.

Findings

Following a description of methods and materials used at the Communicable Disease Center in studying this problem, they summarized the findings:

The activity of a given phage of some strains of diphtheria bacilli may be increased from 10 or 100 up to 10,000 or even 100,000.

Of 37 strains of avirulent *C. diphtheriae* so far tested, the change to virulence has been induced in only six, using six different bacteriophages for each culture.

Virulence may be induced in a given strain by one phage but not by another.

Although two phages specific for, and propagated continuously on, virulent, gravis-type *C. diphtheriae* have been among the six phages used in these studies, no avirulent gravis strain has acquired virulence as a result of phage action.

The change of virulence has so far been induced only in mitislike strains, in spite of as many as 50 culture-to-culture passages with some avirulent strains.

What appeared to be bacteria-free bacteriophage suspensions yielded typical virulence tests in rabbits. The reactions seemed to be due to toxin, but origin of the toxin is not clear.

New Washing Method Permits Cell Re-use

A procedure for reclaiming and reusing bacterial cells employed for adsorption of antibody in the production of streptococcus typing serums has been devised by Elaine L. Updyke, Sc.D., and Elizabeth Conroy, M.S., bacteriologists with the Communicable Disease Center, Public Health Service.

The large volumes of broth cultures that must be handled to obtain enough streptococcus cells for the adsorption process make it advantageous to use the same cells repeatedly, the bacteriologists explained.

The packed cells are reclaimed after use by suspension in 4 to 5 volumes of N/5 HCl in physiological saline and overnight refrigeration at 4° to 10° C. The acid-cell suspension is centrifuged and the cells washed three times in 4 to 5 volumes of physiological saline. The second saline suspension is adjusted to pH 7.0-7.2 with N/1 NaOH. Cells receiving this treatment have been satisfactory for as many as eight adsorptions, they reported.

Practical Technique

Resuspension of the tightly packed cells for the acid and saline washes is facilitated by a midget household electric mixer, the blade of which fits easily into a 50-ml. centrifuge tube. The mixer blade is transferred from tube to tube after a tap water rinse, and 20 specimens can be suspended in the time previously required for 1.

This technique, the bacteriologists said, has proved practical in routine use and was adopted without further study to ease the laboratory work-

load. It takes less time and labor than the growth and collection of fresh cells, even with a Sharpless centrifuge available, they found.

Other workers, they suggested, may want to investigate the procedure further—to study the efficacy of other concentrations of HCl, of other acids, of alkalis, or of high salt concentrations, and to determine the optimum time of all exposures to acid and the length of refrigeration. Possibly, they concluded this technique can be adapted to other bacterial antigen-antibody systems.

Better Procedures for Culture Recognition

A variety of environmental conditions capable of modifying metabolite production can affect population changes in *Brucella* cultures, both quantitatively and qualitatively, and better recognition of them can assist in improving routine laboratory procedures, asserted Werner Braun, Ph.D., and Robert J. Goodlow, Ph.D., of the Chemical Corps Biological Laboratories, Camp Detrick, Frederick, Md.

Pertinent Data

In reviewing the problem of stabilizing *Brucella* cultures, the bacteriologists stressed the recognition

of alanine and valine as two naturally produced amino acids which can selectively enhance the establishment of cells with different antigenicity, immunogenicity, and virulence. Pertinent *in vitro* data and their evaluated relationship to some problems of routine laboratory procedures were outlined as follows:

The degree of heterogeneity in heterogeneous cultures should be ascertained whenever possible and every effort made to start new cultures with a homogeneous inoculum. Colonial morphology is a helpful indicator of antigenicity and virulence.

Cultures should be incubated as briefly and transfers made as infrequently as possible since population changes are likely to occur during any period of growth.

Solid media are preferable to liquid media for maintaining stock cultures. The inhibitory effects of metabolites and the effects upon population changes are far less pronounced on solid media.

Transfers from single colonies of cells with the desired characteristics are preferable to mass transfers. Single colony isolates tend to promote the maintenance of homogeneous cultures since it is more likely that even a small proportion of mutant cells in the parent culture would be excluded in transfers from single colonies. Conversely, they might carry over such mutant cells,

the nurse's home visit and rural sanitation



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thus preserving existing heterogeneity by giving the cells opportunity for further establishment.

The recognition of the role of the substrate in the production of selectively inhibitory amino acids and the discovery that with alanine such inhibition can be overcome by adding pantothenate indicate that appropriate modifications of the medium can greatly reduce the opportunity for population changes.

Ultimate Goal

The bacteriologists concluded that the "ultimate goal for the isolation of *Brucella* from the bloodstream should be a method permitting direct cultivation onto solid media." They warned that alanine production is greatly enhanced in liquid media in the presence of immune serum, and that under such conditions population changes can occur rapidly which might cause erroneous identification of the type present *in vivo*.

Search Goes on for Agent Of Nonspecific Urethritis

Nonspecific urethritis and prostatitis could not be related causally to any particular microbial agent, concluded Capt. Bernard M. Wagner, MC, Capt. William H. Morse, MC, and Col. Dwight M. Kuhns, MC, members of the laboratory service and urology section, Walter Reed Army Medical Center, Washington, D. C.

Seeking to define an etiologic agent, to determine the role of pleuropneumonia-like organisms (PPLO), and to find the most satisfactory treatment method, the Army researchers studied nonspecific urethritis and prostatitis in 84 young males with a history of sexual exposure preceding the onset of acute conditions.

Increase in Korea

Nonspecific urethritis and prostatitis were observed in the last war but have increased since the Korean action, especially among servicemen

overseas, they reported. Although it was once thought that nonspecific urethritis resulted from inadequately treated gonorrhea, the Walter Reed studies indicated that only 32.1 percent of the patients had a gonorrhea history. Fifty-eight percent had received antimicrobial agents for acute urethritis—gonorrheal or nonspecific.

"By far, urethritis was the outstanding clinical picture," they reported. "However, 11 percent of the cases had signs and symptoms of a primary nonspecific prostatitis. In 29 percent, urethritis and prostatitis were present in equally severe form."

The study confirmed previous findings, they announced. "We were unable to demonstrate an agent or agents which could be considered as etiologic in the light of present knowledge. While human strains of PPLO may be found in an unpredictable number of cases, they cannot be implicated as causal agents at this time."

Terramycin Effective

They continued: "The almost constant parallel isolation of staphylococci with PPLO in our study and others raises the question as to whether the PPLO might not be L variants of the staphylococci." But the criteria for PPLO identification needs further investigation, they said.

No relationship was apparent between the type of organisms isolated and the ultimate effect of therapy, Capt. Wagner and his colleagues reported. Terramycin induced the most striking changes by effecting clinical response early and more completely than aureomycin plus a sharp and statistically significant reduction in the total relapses, they said. The simultaneous development of resistance to terramycin when organisms were resistant to aureomycin has been demonstrated, but it is not true that clinical failure with one means failure with the other, they said. The efficacy of terramycin observed in nonspecific urethritis suggests that the drug acts on susceptible agents relatively

resistant to aureomycin, but the exact mechanism of its action must remain speculative at this time, the researchers concluded.

Histoplasmosis Antigens Reported Isolated

The isolation of an antigen that apparently is more specific for histoplasmosis than the long-used histoplasmin which reacts with other mycotic infections was reported in a preliminary study by Charlotte C. Campbell, B.S., mycologist of the Army Medical Service Graduate School, Walter Reed Army Medical Center, Washington, D.C.

This antigen, Miss Campbell said, is produced in abundance by the mycelial phase of *Histoplasma capsulatum* and reacts only with serums from histoplasma infections, but it does not detect very early complement-fixing antibody.

Another antigen isolated in the same study, is produced in greater quantity by the yeast phase of the organism and detects antibody in serums from very early cases of mild histoplasmosis. However, this antigen also reacts with serums from early cases of other mild mycotic infections.

Miss Campbell emphasized the importance of using the yeast phase antigen to detect primary histoplasmosis and use of the mycelial phase antigen to follow the serologic course of more severe cases of the disease.

Neutral Red Reaction Proves Valuable

A study of 168 freshly isolated acid-fast strains culturally consistent with *Mycobacterium tuberculosis* suggests that the neutral red test measures the virulence of mycobacteria as satisfactorily as the conventional inoculation of experimental laboratory animals.

The tests were evaluated by Maj. Warren C. Morse, MSC, Martha C.

Dail, and Lt. Irving Olitzky, MSC, in the bacteriology department of the Army Medical Service Graduate School, Walter Reed Army Medical Center, Washington, D. C., and in the Second Army Area Medical Laboratory, Ft. George G. Meade, Md.

Timesaver—Reduces Hazard

They found that the use of the neutral red reaction effects an appreciable saving of time in the laboratory diagnosis of tuberculosis, taking 2 hours as compared to the 3 to 6 weeks required for animal virulence studies. Furthermore, they found that the use of the neutral red reaction reduces the health hazard to laboratory personnel working with infected animals maintained for pathogenicity studies.

Index of Sterility Proves Reliable

Use of a heat-resistant, spore-forming organism as an indicator of the sterility of laboratory instruments—similar to the process canners use on experimental packs—was recommended by Harriette D. Vera, Ph.D., research bacteriologist of the Baltimore Biological Laboratory.

Dr. Vera suggested that a few units contaminated with an organism like *Clostridium sporogenes* and included with the other units to be sterilized would be a reliable index of sterility. "It is possible to test large numbers of units of unknown contamination and obtain no evidence of failure," she said.

Experiment Results

The results of a sterilization experiment on 75 test tubes of unknown contamination and 25 tubes deliberately contaminated with *C. sporogenes* were given as an example. The tubes, dried, stoppered, evacuated, and given a heat application of about 800° F. briefly at the base, were tested about 2 months after preparation.

No organisms were found on the 75 test tubes of unknown contamination. But *C. sporogenes* was recovered from 19 of the 25 contaminated tubes—proof that the sterilization was not sufficiently effective. None of the 75 tubes had been contaminated by chance by a resistant organism—but they might have been.

"If the contaminated control tubes had not been included in the test, the heating procedure would have seemed satisfactory, and the results would have given a false sense of security," stated Dr. Vera, pointing out that a process that kills *C. sporogenes* will assuredly kill the more common contaminants such as cocci or coliform organisms.

Isolation of *C. sporogenes* from rolls of dental cotton after they had been autoclaved at 121° C. for 15 to 30 minutes led to a series of tests and the use of the organism in the Baltimore laboratory as an indicator of sterilization efficiency. The cotton was being investigated for use as air filters on the needles of bleeding units.

Efficiency Indicator

A *Bacillus* could also be used as an indicator, Dr. Vera said. But a 5-day culture of *C. sporogenes* in dextrose-free thioglycollate broth ordinarily shows heavy spore production and is convenient for use in contaminating control units, she re-

ported. It can be washed through the lumen of hypodermic needles and tubing, and can be applied to cotton, glassware, and other articles. Contaminated units are preferably prepared weeks or months in advance, dried, stored, and used as needed.

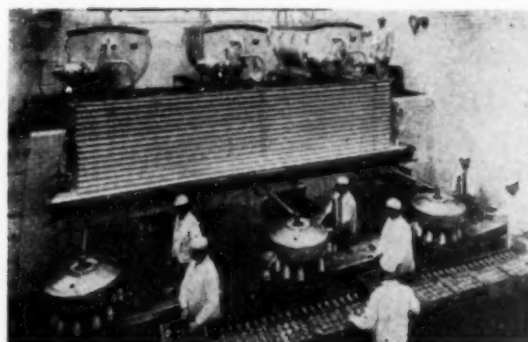
Reports on Antigen Tests For Brucella Infection

Work on the laboratory confirmation of *Brucella* infection was reported by Nell Hirschberg, Ph.D., of the North Carolina State Laboratory of Hygiene, and Mary E. Yarbrough, Ph.D., of Meredith College at Raleigh.

Results of tests using dilute phenol extracted antigens of *Brucella*, adsorbed onto collodion and onto sheep erythrocytes, were described in detail. Time and temperature at which adsorption of the antigen takes place, are important factors in the results obtained, they said.

Long extraction and simple concentration by evaporation have not increased the reactivity after adsorption onto collodion. Both procedures result in extracts unsuitable for use with sheep cells, they commented. All antigens prepared by dilute phenol extraction show a very low carbohydrate content by the anthrone reaction.

milk pasteurization



The Tuberculosis Control Problem And Modern Therapy

The newer methods of treating tuberculosis, such as chemotherapy, excisional surgery, and vaccination, were viewed with tempered optimism at the special session on tuberculosis control. The results so far are promising, the conferees were told, but as yet there is neither a widely specific cure nor effective immunization. Tuberculosis, they were reminded, is by no means a disappearing disease.

Careful Evaluation Urged For Therapy Programs

The current world-wide drop in tuberculosis mortality is a phenomenon that is gratifying but not wholly explained, Esmond R. Long, M.D., director of medical research for the National Tuberculosis Association, and director of the Henry Phipps Institute, University of Pennsylvania, stated. Dr. Long believes the decrease in tuberculosis mortality rates should supply leads for extensive social and medical research.

Optimism of experts toward chemotherapy of tuberculosis, he declared, is justified by the enthusiastic and massive accumulation of data, but he urged further unbiased assessment of the results of different methods of administration of the drugs.

Other developments in tuberculosis treatment and control cited by Dr. Long were: (1) chest surgery to remove small infected segments of the lung; (2) advancement of methods to limit sources of contagion; (3) continuous and repeated chest surveys with X-ray; and (4) expanding BCG programs, particularly the

investigations relating to the methods of administration of this vaccine.

Interest in analytical evaluations of the BCG vaccination programs, which are being conducted by the Tuberculosis Research Office of the World Health Organization, was expressed by the speaker. Also he hoped that WHO will investigate the results of oral administration of BCG as practiced in Latin America.

Surgery and New Drugs Helping More Patients

Newer methods of therapy offer assurance of recovery and freedom from relapse to an increasing proportion of tuberculosis patients, Harold L. Israel, M.D., M.P.H., of the Graduate School of Medicine, University of Pennsylvania, stated. The last half dozen years have brought new advances in chemotherapy and excisional surgery, he continued, although prolonged bed rest is still necessary in treating tuberculosis.

"The objective of treatment is no longer merely to abolish symptoms or to render the patient noninfectious; the present aim is to excise, whenever possible, residual lesions that may be responsible for relapse," Dr. Israel said.

Chemotherapy is effective, "in small measure or great," in almost every case of tuberculosis, he stated. It often results in healing of minimal or moderately advanced tuberculosis and, in advanced cases, makes surgery possible.

Surgical Risk Small

In excisional surgery, Dr. Israel said, the surgical risk is "reasonably small." He added that, in the fu-

ture, surgery may be advised for small tuberculous infiltrations "as promptly as it is now advised for tumors." Surgery should be followed by a 6-month period of bed rest and chemotherapy to insure healing of the smaller residuals, he pointed out, urging that large scale, carefully controlled studies be made to determine the importance of bed rest, "the most costly and onerous factor in present day treatment."

Discharges against advice and case mortality rates have declined markedly in the last 15 years, the physician reported, largely because of the greater receptivity of patients to the newer methods of treatment.

The present aim is to go beyond inactivity of the disease as a criteria to eradication of any residuals large enough to cause relapse, Dr. Israel stated. If this is to be accomplished no immediate saving in time or money can be expected, he continued, but both will be well spent if observation confirms the growing belief that most tuberculous patients can be cured, rather than patched up.

Ohio County Coordinates Tuberculosis Control

Administration of tuberculosis control organizations in many metropolitan areas lags behind therapeutic advances, and, unfortunately, legislative attempts to cope with the problem have not always considered the epidemiology of the disease, reported Joseph B. Stocklen, M.D., Cuyahoga County, Ohio, tuberculosis controller; Dean Halliday, executive secretary of the Anti-Tuberculosis League of Cleveland and Cuyahoga County; and Harold J. Knapp, M.D., Cleveland's commissioner of health.

The three officials cited Ohio's situation as typical. Although control is a health department responsibility, the county government is obligated to finance hospitalization and the health department finances case finding and follow-up, making standardization of control impossible except by cooperative agreement.

Control coordination has been achieved in Cuyahoga County, Ohio, by naming the medical superintendent of the county tuberculosis hospital to the position of deputy health commissioner in each of the six health departments of the county, thus giving the health units continued control responsibility for case finding, hospitalization, and follow-up.

A Community Function

The superintendent directs control activities from a centrally located clinic in Cleveland rather than from the hospital. "We believe this is important," Dr. Stocklen and his colleagues stated, "since the personnel of the tuberculosis hospital, which often is isolated geographically, tend to develop an insular attitude," and, they added, control of tuberculosis is a community function, operating inefficiently if overemphasis is placed on any one phase of control. Tuberculosis clinics in the county are staffed by part- and full-time physicians who have had extensive experience in tuberculosis hospitals.

The Anti-Tuberculosis League leads in education program and has supported the official control program whenever needed, stimulating the development of the county-wide program which culminated in the creation of the position of county tuberculosis controller in 1943. It is believed that this interlocking program with official agencies is unique among large city voluntary tuberculosis agencies in the country, the three leaders remarked.

Chest X-ray surveys in the county have been continuous since 1943, and the percentage of tuberculosis cases found among persons X-rayed has decreased from 1.5 to .6 in 1949. From the 579 deaths and approximately 1,500 new cases reported in 1940, and 262 deaths and 2,165 new cases in 1951, it is obvious, they said, "that we grossly underestimated the number of cases of unknown tuberculosis existing in the general population in 1940." Many cases either

were not known or not reported, Dr. Stocklen and his associates pointed out.

Through the years, the many tuberculosis patients needing hospital care locally has been a serious obstacle in achieving adequate control, they continued. A new addition to the county tuberculosis hospital has added 260 beds to the 850 existing high standard beds, but with the current waiting list at 258, "the staffing of these beds now appears to be a problem of the greatest magnitude," they asserted.

New Emergency Treatment

They mentioned an emergency measure adopted in 1947 when patients with active tuberculosis were admitted to the hospital for 3 days during which pneumoperitoneum was instituted and in many cases phrenic nerve interruption employed. Patients then received pneumoperitoneum on an ambulatory basis, and now streptomycin and para-aminosalicylic acid are used with excellent results, they reported.

Follow-up of 14,000 cases on the registers is a problem for the nursing divisions. Cases include all degrees of activity. Dr. Stocklen and his associates said that they are "attempting to decide whether we should follow cases of minimal, inactive tuberculosis. There is no question but that a small number of

these cases do relapse. Whether the number is large enough to justify following them remains to be answered."

Tuberculosis Problem Remains Active

"Tuberculosis is by no means a disappearing disease in this country, whether mortality or morbidity is the measure," said Robert J. Anderson, M.D., chief, Division of Chronic Disease and Tuberculosis, Public Health Service.

According to the latest estimates of the National Tuberculosis Association and the Public Health Service, there are now 1,200,000 persons in this country with tuberculosis. A half million cases are known to health departments, and 250,000 of these are active cases. In addition, there are 700,000 unknown cases, of which 150,000 are believed to be active, he reported.

Pressing Shortages

Shortage of tuberculosis facilities and manpower, and problems of budget and staff are as pressing as any in public health, Dr. Anderson said. In connection with the Hill-Burton Hospital Construction Program, it has been estimated that the Nation needs at least 50,000 new tuberculo-

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services**

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sis beds. Others maintain that the ratio should be 1 bed per 1,000 population. Despite the need, only 2,000 new beds were added under the Hill-Burton program last year, he stated.

Last year too, approximately 2,700 tuberculosis beds went unused because of a nurse shortage. The shortage of physicians is equally pressing. We must turn to or develop other personnel, if we are unable to expand the output of our physicians and nurse training sources, said Dr. Anderson. Trained aides may substitute for professional nurses, but there is no substitute for a well-trained chest physician, he said.

Dr. Anderson stressed the importance of continuing to stimulate interest in tuberculosis on the part of younger medical men and of training more physicians in tuberculosis control. In one Federal Security Agency region, not a single State now has a State controller, although only a few years ago every State in that region had a full-time tuberculosis control officer.

Dr. Anderson warned against the relaxation of effort during recent years in case-finding activities. Two million less X-rays were taken last year than the year before. At the rate of one previously unknown active case per 1,000 people X-rayed, 2,000 contagious cases were not found. Thus, he said, the tuberculosis search must be intensified in population groups from which the disease is most difficult to dislodge—as among the Indians, who have a tuberculosis death rate 5 times as high as the population at large; among mental hospital patients whose death rate is 18 times higher; and among the Negro group in which tuberculosis is responsible for every fifteenth death.

Hospitalization and treatment must be complete, which means that the final stage of rehabilitation must not be overlooked, he summed up. The variation in range of rehabilitation services offered to patients is wide, he said. Rehabilitation is more a matter of philosophy of the

sanatorium staff than an additional, expensive service, he said.

Vaccination with BCG may offer some protection to persons who are exposed to tuberculosis, but “thus far we possess neither a widely specific cure nor effective immunization,” concluded Dr. Anderson. “We do know, however, the methods that in the past have brought us partial success,” he said, “and so we know full well what we must continue to do in the years to come.”

The Older Are Hit Harder By Pulmonary Tuberculosis

Could the exposure of fewer children to tuberculosis infection account for the phenomenal decline in infectious cases among children under 10, asked Arthur B. Robins, M.D., Dr.P.H., director, bureau of tuberculosis, New York City Health Department, in his discussion of the age relationship of tuberculosis cases.

Dr. Robins noted a significant trend in tuberculosis epidemiology between 1932 and 1950: The proportion of new pulmonary tuberculosis cases occurring in persons over 45 had doubled; more than 65 percent of New York City residents who died from the disease were over 45; men accounted for 85 percent of the deaths; mortality from all forms of tuberculosis in children under 10 reached an all-time low.

The general decrease in infection, evidenced in fewer communicable cases, their more effective isolation, and the increased resistance of exposed individuals resulting from improved living standards, was undoubtedly a major factor in the decline of infectious cases among children, Dr. Robins said.

Children Under 10

To test the hypothesis that fewer children under 10 were exposed to tuberculosis, a study with far-reaching implications was undertaken in New York City households of male

index cases. A sample of 778 cases was selected at random from a total of 3,467 men over 25 with pulmonary tuberculosis reported for the first time in 1950. Both sample and total were divided into broad age groups: those 25 to 45, and those over 45. The data were analyzed by age and race distributions; by distribution of index cases and associates according to stage of disease; by relationship of associates to index cases; by distribution of index cases and associates according to household size; and by age distribution of household associates according to sex but exclusive of marital partners. Dr. Robins discussed the findings:

Pulmonary tuberculosis in older men is more advanced at the time of discovery—56 percent of males over 45, compared with 40 percent of men 25 to 45, had far advanced disease at time of the report. The percentages were almost reversed for minimal and moderately advanced stages of tuberculosis.

Diagnoses of Tuberculosis Are Major Concern

The dependability of bacteriological diagnoses of tuberculosis is a major concern of every laboratory director, Mildred B. Jefferies, M.S., chief bacteriologist, and Albert V. Hardy, M.D., director, bureau of laboratories of the Florida State Board of Health, stated.

Specimens for evaluation may deteriorate significantly during distribution, they said. Variations in findings when widely experienced bacteriologists examine the same specimen for tuberculosis is admitted. Controls may be used in checking techniques, as in staining, but not in measuring the sensitivity of the tests, they said.

Discussing their experience with 71,852 specimens examined by cultures and smear methods over 4 years, they concluded that more effective laboratory procedures were becoming evident.

Government, Industry, Labor In Industrial Hygiene

Government, industry, and labor all have responsibilities in developing sound programs of industrial hygiene, according to the papers presented to the industrial hygiene section of APHA. A representative of an official industrial hygiene agency outlined what he believes is government's function and indicated what is expected from industry and labor. Representatives of labor and industry named the services they need from the official agencies. They agreed that a high degree of agreement and cooperation among the three is essential.

Government's Function Is Study and Development

Government's primary function in the field of industrial hygiene is research and development, with direct services being provided by State agencies only when industry cannot assume the responsibility, maintained Henry N. Doyle, chief of the State aid branch, Division of Occupational Health, Public Health Service.

Outlining government's activities in meeting its responsibility "to show the way," he noted that the Public Health Service's Division of Occupational Health carries out a broad program, ranging from studies of health hazards resulting from occupational exposures to various toxic materials to projects affecting the entire well-being of the worker. It conducts field investigations and demonstrations; makes laboratory tests and studies; gives technical and administrative aid to the State and local agencies; provides infor-

mational services; and maintains cooperative relationships with other agencies and activities concerned with occupational health.

State and local industrial hygiene agencies, which are found in 43 States, 2 Territories, and 9 cities and counties, serve industry and labor and demonstrate techniques to help them solve their own health problems. Only in a few instances, he pointed out, do these units have law enforcement powers; generally, they have found educational methods to be much more effective.

Cooperation Expected

"From labor we expect a better understanding of the aims of occupational health," he said. "We expect labor to realize that industrial hygiene is preventive medicine and not a medical care program. . . . We seek labor's cooperation in carrying out occupational health studies. . . . We expect labor to be a part of the community, to demand minimum community health services where they do not exist."

He specified also that the union health and safety committees are of

invaluable assistance in solving industrial health problems and suggested that unions make better use of their opportunities for health education.

Mr. Doyle urged that management cooperate in industry-wide studies, receive the scientific reports made by the official agencies with open minds, and develop their own occupational health programs as rapidly as possible.

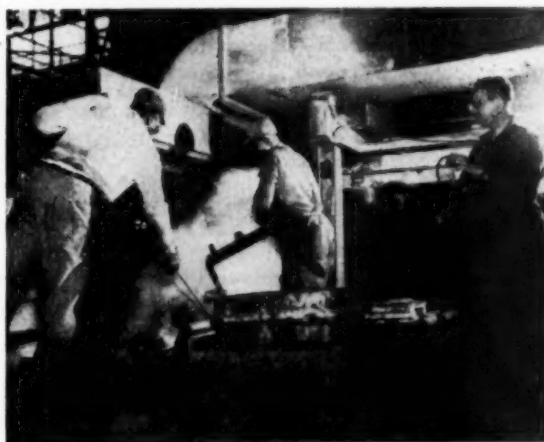
Above all, he said, both management and labor should bring industrial health problems to the attention of the local occupational health unit.

Commenting on accomplishments and current trends in the field, Mr. Doyle said: "Today, the average industrial plant is a safer place, accident-wise, than is the nonindustrial environment. The classical occupational diseases are no longer the 'black plague' of industry. We have seen industrial medicine progress from strictly an industrial trauma service to a real industrial health department."

He pointed out, however, that despite this progress, "only 10 to 15 percent of the working population have any occupational health facilities at their place of employment," a situation which he attributed to the remissness of industry and labor generally in accepting the responsibility for providing industrial hy-

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industrial
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giene services themselves, and to the lack of adequate funds and staff to enable the government agencies to even begin to do the job.

Better Public Agencies Desired by Industry

Competent, unbiased public industrial hygiene agencies sincerely trying to help industry provide better conditions for its workers will receive industry's admiration and support, Louis E. Newman, manager of the health and safety services department, General Electric Company, New York City, declared.

In stating the need for public agencies of industrial hygiene, Mr. Newman said that management is often unaware of job environments that adversely affect the health, productivity, or morale of its workers. He named as examples of mass occurrence of occupational diseases the cases of radium poisoning in the watch industry during World War I, beryllium poisoning in the fluorescent lamp industry following World War II, and silicosis in the mining and foundry industries.

Public industrial hygiene agencies can also serve as arbitrators through unbiased fact-finding and advice when management and employees differ about a hazard, he said.

Advice and Counsel

Industry, Mr. Newman said, needs advice and counsel from a competent public hygiene staff, but responsibility for correcting hazards rests with the operating management.

He stressed the need for recommendations that are sensible, practical, and economical. Industry must make a profit to survive and unnecessarily expensive control measures may work a hardship on a business.

Other important service characteristics listed for public agencies were dispatch and brevity in giving reports, agreement on uniform standards, accurate evaluation of the

problem, use of language that is understandable to the layman and is persuasive, and allaying of needless fears among employees during an investigation.

The minimum unit set-up should have proper balance in the fields of medicine, engineering, and chemistry, he said. Later, other more specialized fields, such as health-physics, biostatistics, and nutrition, can be added.

To get needed jobs done and to prevent omission of large areas, Mr. Newman suggested that the areas of Federal and State responsibility be clearly defined.

Study, Revision of Laws Suggested by Labor

Study and revision of present statutes so as to provide a clearly defined and complete industrial health service without overlapping of Federal, State, and local jurisdictions was urged by A. J. Hayes, president of the International Association of Machinists.

He reported that a paper is now being prepared by the Public Health Service listing various elements of an occupational health program. This, Mr. Hayes continued, should be of substantial assistance not only to legislators, but to management and labor alike.

Man-days lost because of illness are 35 times as many as lost from strikes and 10 times as many as from industrial accidents, he said, and this is not only unprofitable, but inhumane. "We cannot be complacent about ill health," he asserted.

A National Problem

The problems of industrial health can be dealt with more constructively if they are recognized as part of the national health picture, Mr. Hayes stated. The worker's health cannot be separated from a larger consideration of the health of those around him—his wife and children, his neighbors, the community, and

the Nation. A recent study by the Division of Occupational Health of the Public Health Service showed the number of absences due to nonoccupational illness or injury to be 116.8 per 1,000 for men and 256.4 for women, he reported.

Health is not only an individual but a national concern, the speaker emphasized; health is part of the national defense. Increased production will be the Nation's salvation; productivity lost because of sickness is a serious threat to America's defense and security, he maintained.

Inadequacy or lack of appropriations for health agencies, overlapping of jurisdictions, the shortage of medical personnel and facilities, and the cost of medical care and of health insurance all contribute to the "appalling" total—4,569,000 in February 1949—of persons who are absent from work on an average weekday because of illness or a disabling condition, Mr. Hayes said, and also help to explain why many industrial plants have not installed medical units.

In closing, the speaker agreed that the responsibility for overcoming these problems is not the sole responsibility of official health agencies, but belongs to every segment of society; that to accomplish the goal of better health services, industry must give full support and encouragement to every Federal and State agency which is promoting better health.

Connecticut Coordinates Worker Health Services

An occupational health program is concerned with all factors which influence the health of industrial workers, declared Stanley H. Osborn, M.D., and J. Howard Johnston, M.D., in their report on the program of the Connecticut State Department of Health. Dr. Osborn is commissioner of health and Dr. Johnston is director of the department's bureau of industrial hygiene.

In 1928, they stated, the bureau of industrial hygiene was established in the State health department to centralize industrial health work. This bureau is concerned directly with improving the environmental conditions in industry and with assisting in establishing well-organized industrial medical services. It also serves, they explained, as a coordinating unit through which services provided by other units of the State health department may be brought to the industrial worker.

Emphasizing that the bureau's staff of physicians, nurses, chemists, and engineers work as a team, Drs. Osborn and Johnston named the primary functions of each: Physicians appraise the worker's health in terms of exposure to toxic substances and to abnormal working conditions, interpret medically the interrelation of the industrial and nonindustrial environments upon the worker's health, and help industry in establishing nonoccupational health services; chemists study and analyze the environment of the worker to determine the nature and concentration of toxic atmospheric contaminants; engineers study methods of controlling these contaminants; and nurses contribute to the discovery of occupational hazards through their contact with in-plant nursing services.

Studies of Hazards

Investigations of occupational hazards mentioned in the report included determination of atmospheric concentrations of such materials as lead dust, chlorinated hydrocarbons, and toluol and the effect of exposure to the materials. In all studies of this type, Drs. Osborn and Johnston said, efforts are made to correlate results obtained from examination of body fluids with symptoms found among exposed workers. They noted also that the hazard involved in the use of recently developed insecticides, such as parathion, is being studied by the same methods.

Problems of radiation exposure, resulting from the new industrial

uses of radioisotopes, X-rays, and natural radioactive materials, are receiving increased attention, they pointed out, as are the effects of noise and heat in industry.

The bureau's services are available at all times upon request from labor or management, medical director or plant nurse. In addition, they said, routine industrial hygiene surveys are conducted periodically, the interval between surveys depending upon the hazards associated with the manufacturing processes. New plants or changes in techniques and processes of old plants receive immediate investigation.

The bureau's value can be measured by the frequent calls for its services and the almost universal cooperation which it receives from industry and labor, Drs. Osborn and Johnston maintained.

Rusk Committee Studies Health Requirements

The reluctance of industry to employ more women, older workers, and the handicapped and the widespread lack of in-plant health services are two major barriers to the complete utilization of the Nation's manpower, asserted Seward E. Miller, M.D., chief of the Public Health Service's Division of Occupational

Health. These barriers are based principally on prejudiced and erroneous impressions, he said, and an educational program to dispel them has been inaugurated by the Health Resources Advisory (Rusk) Committee of the Office of Defense Mobilization.

One pamphlet prepared by the committee, entitled "The Worker and His Health," affirms that sickness absenteeism in industry, causing a loss each year of 400 to 500 million man-days, can be reduced by one-third to one-half with the establishment of in-plant health services, Dr. Miller reported. Three other pamphlets urge the utilization of women, older workers, and the handicapped in industry by showing that job performance records for these groups compare favorably with those of other workers. Dr. Miller emphasized that proper placement of these persons, considering all factors of special health problems, physical ability, and performance capability, enables them to perform many jobs successfully.

In-Plant Health Services

The committee has given considerable attention to methods of extending in-plant health service, particularly among smaller industries, Dr. Miller noted. Following a meeting with prominent leaders in the field of industrial medicine from universities, private industry, and vol-

control
of
malaria

a half century
of progress →



untary and official organizations, which reaffirmed the committee's convictions that a great need exists for comprehensive in-plant health services, the committee designated a task force to investigate methods by which Government contractors could be induced to furnish at least minimal protective health services. Its efforts resulted in revisions to the Safety and Health Standards set up by the Department of Labor for the guidance of Government contractors. Standards dealing with

occupational health requirements were entirely rewritten under three headings: medical services, environmental conditions and personal services, and special sanitation services.

Other Activities

Since its establishment in August 1950, other accomplishments of the committee have been the creation of the Interagency Health Resources Council to coordinate the activities of medical-health agencies; the establishment of a single national

blood program coordinating the efforts of the Red Cross, the Armed Forces, and the Federal Civil Defense Administration; a study of civil defense health problems; and a review of military health personnel needs, resulting, to date, in estimated savings to the Armed Forces of 40 to 50 million dollars and the conservation of the services of 5,000 physicians for the civilian public. "All these activities," Dr. Miller stated, "either directly or indirectly, affect the industrial hygienist."

Methods of Administration In Medical Care Plans

Administrative methods designed to improve the quality of medical care were described in papers presented to the medical care section. These methods included: provision of medical care inside as well as outside the hospital, embracing both specialist and rehabilitation services; control of prescribing practices and of payments made to physicians under fee-for-service plans; and competent supervision of health insurance plans.

Regional Organizations Improve Health Services

Regional organization to improve health services for residents in the area of influence of medical teaching centers has been stimulated by the need for coordinating diverse health services and resources. This was one of the major points in a progress report on a survey of regional plans now being made by Leonard S. Rosenfeld, M.D., and Ruth Wadman, A.B., of the Division of Public

Health Methods, Public Health Service, and Nathan Kramer, A.B., Subcommittee on Medical Care, Committee on Administrative Practice, APHA.

Such regional organizations are designed to improve the quality and increase the availability and efficiency of all medical and related services within a community.

Their tentative findings are based on a survey of five such programs (those of the University of Colorado, Emory University, Medical College of Virginia, University of Buffalo, and the University of Kansas), and on a review of the published material on five plans still to be visited (Bingham Associates, Rochester Regional Hospital Council, New York University, University of Michigan, and Tulane University).

All plans, except Bingham Associates, which began in 1931, were launched in the 3- or 4-year period immediately following World War II, according to Dr. Rosenfeld and his co-workers. In eight plans the medical school has primary administrative responsibility.

In the other two, medical schools participate but the administrative responsibility is carried by another agency. Bingham Associates is a

philanthropic agency governed by a board of trustees; the Rochester program is governed by a board of directors composed of hospital and public representatives.

Community Services

The various services include graduate and postgraduate medical education and regular visits by consultants to hospitals, they continued. Several programs include educational and advisory services for hospital administrators and ancillary personnel.

Two of the plans have developed services for individual patients in addition to clinical consultation given as part of medical education.

Auxiliary services represent regional pooling of responsibilities ordinarily carried on by hospitals individually, such as central purchasing, blood bank, accounting and record systems, ambulance services, surveys and studies, Dr. Rosenfeld said.

All plans are designed to serve the practicing physician in the area. Some approach the physician directly, others through the hospital staff, some through both. In three plans all physicians in the areas are eligible to participate; in seven, hospital affiliation is a factor.

Financial Support

During their initial periods of operation, nine plans received support from philanthropic agencies. Tu-

lane received support from the Public Health Service. Buffalo and Kansas are also receiving support from their State governments. In all cases local financial support has been limited. The plans are now requesting financial participation by affiliated hospitals, voluntary agencies, and physicians. In Rochester, Blue Cross is contributing. From information accumulated thus far, it appears that the costs of maintaining regional services are relatively small when compared with the total costs of medical and hospital care in an area.

There is need for continuing experimentation, observation and evaluation, the investigators concluded. Because of differences in area, population distribution and density, in health needs and resources, in local traditions and attitudes, no single pattern of regional organization is suitable to all parts of the country, they said.

12 Years of Experience Modify Prepay Concepts

In discussing the early experience of the Associated Medical Services of Ontario, a Canadian prepayment medical care program, J. A. Hannah, M.D., its managing director, said that the years from 1937 to 1949 represented an organization period "during which many of our idealistic concepts were severely modified through experience."

"We believe attempts to provide such a service on a wholesale basis with insufficient experience has been, and will continue to be, the cause of failures and dissatisfaction on the part of both the public and the profession," he stressed, in reviewing experience of the plan approved by the Ontario Medical Association.

Accordingly, the Associated Medical Services was organized and maintained as a research project. Dr. Hannah's discussion was confined to a brief interpretation of special cost studies and to a statement

of the program's income and expenditures for the 12-year period.

Dr. Hannah reported that cost data are accumulated on a "number of months service rendered" basis for each year, which, he said, eliminates the making of adjustments for additions and subtractions from month to month.

Early Surplus Unlikely

He warned that in starting any medical prepayment plan, "too great optimism over a favorable surplus during the first 2-3 years is unwarranted," adding, "on the basis of our experience, we are beginning to feel that we may expect a crisis approximately every 5 years."

Dr. Hannah did not list the extent of medical coverage, but he remarked that in 1937 the Associated Medical Services was enthusiastic about "complete medical service," a concept which later was modified to check any trend toward insolvency. The first basic lesson learned, Dr. Hannah said, was that whenever the fund's solvency was threatened, services should be reduced but subscription rates should not be increased. Increasing rates retains subscribers who intend to make excessive use of their privileges but eliminates those who have not needed the service, he explained.

The Associated Medical Services withdrew well-baby visits and special nursing care, at an early stage,

because they were uncontrollable under a prepayment plan and strained harmonious professional relationships. Also, he added, it is not possible to retain solvency on a fee-for-service basis if home and office calls are included. The cost of administration is equal to or greater than the cost of actual service, it was discovered, and by paying a physician directly, patients get the same services at less cost. It was advisable to pay the larger bills which threatened family solvency, he said.

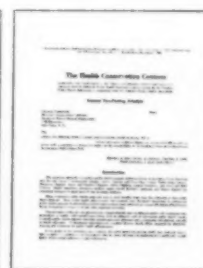
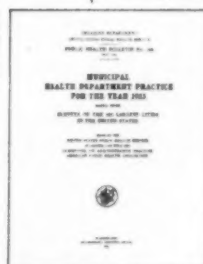
Obstetrical Load Heavy

According to Dr. Hannah, the plan paid out more than twice its expected share of obstetrical services because it appealed to subscribers in the child-bearing period. He mentioned an A. M. S. plan in preparation which will enable budgeting against cost of childbirth and prevent unfair use of the service at the expense of other subscribers.

Dr. Hannah considered coverage for people in later life well within the application of the insurance principle provided they have subscribed for "some considerable time prior to attaining that age."

One benefit from careful scrutiny of cost data was the observed increase in average costs. Dr. Hannah said these figures indicate the cost for each and every month's

appraisal of health services



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service available, whether or not the subscriber sees his physician or enters a hospital. For example, among outstanding cost rises: X-rays doubled, rising from 5 cents in 1941 to 10 cents in 1949; anesthesia rose from 4 cents per month's service rendered in 1940 to 7 cents in 1949 and then increased more sharply; consultations stayed at 3 cents per month's service until the end of 1943, rising to 8 cents in 1947, and dropping to 7 cents in 1949.

Doctors, Miners Write "Finest Chapter"

The arduous, costly task of restoring men who have suffered crushed limbs and backs in the coal mines is "one of the finest chapters in the history of medicine," said Warren F. Draper, M.D., executive medical officer of the United Mine Workers of America Welfare and Retirement Fund in Washington, D. C.

In describing the UMWA medical care program, in operation 32½ months as of July 1, 1952, he stated that thousands of crippled miners have been restored to usefulness and reemployment, and that physicians in their devoted and selfless treatment of these men are bringing new knowledge of inestimable value to medical science.

UMWA Hospital Projects

The UMWA fund has been responsible for creating a memorial hospital association in Kentucky, Virginia, and West Virginia to construct, equip, and operate new hospitals in mining areas desperately needing hospital and medical care, Dr. Draper said. These three non-profit associations, organized under respective State laws, have built new hospitals to care for fund beneficiaries at Harlan, Pikeville, Hazard, Middlesboro, Whitesburg, and Wheelwright in Kentucky; at Wise in Virginia; and at Beckley, Logan, and Williamson in West Virginia.

Money for the memorial projects is provided by the UMWA Welfare and Retirement Fund through loans. The hospitals are open to members of the communities to the extent that their facilities are not needed by fund beneficiaries.

The fund neither owns nor operates hospitals but uses existing facilities according to convenience of location and willingness and ability to provide satisfactory service on an acceptable cost basis, Dr. Draper pointed out. Some 2,100 hospitals have cared for UMWA patients. Some 8,000 physicians have received payment for services. Of the combined cost of hospital and physician services, about two-thirds was for hospitals, and one-third for physicians.

Cost of Medical Care

"Completed data on hospital and medical costs in a program the size of our own should be of extraordinary value in charting the course of the future," he said in explanation of not publicizing itemized expenditures until costs have been stabilized to afford a reasonable basis for comparison with other plans.

Approximately 1½ million miners and their family dependents are potential beneficiaries of the program. The UMWA executive medical officer said that during the year ending June 30, 1952, 2,154,822 days of hospital and medical care were provided to 215,372 beneficiaries at a cost of \$49,996,517.88. Three percent of the expenditures for all medical care benefits represented the cost of administration of the medical and hospital service, including 10 area offices which cover the coal mining regions.

Services Provided

Services included in the program are: hospital care for such time as necessary, medical care in the hospitals, specialists' services outside the hospital as necessary, and rehabilitation services under the management of physicians at special centers.

Also included are drugs administered to hospital in-patients; certain expensive drugs requiring long, continuing use outside the hospital; physical examinations in connection with applications for prescribed cash benefits; and home and office care for severely handicapped patients following discharge from special rehabilitation centers.

The program does not include: dentistry, tonsil and adenoid removal, long-term treatment for mental illness, services for which the employer or some other party is legally responsible such as medical service in compensation cases, and available services which the patient may be entitled to receive from a Government agency, such as treatment for tuberculosis or mental disease in a State or county hospital, or from a private organization in the instance of tuberculosis, infantile paralysis, or cancer.

Baltimore City Reviews Prescription Practices

Increased prescribing of official drugs instead of proprietary preparations may be one way to lower the cost of public medical care programs, according to the findings from a study of prescribing practices in the Baltimore City medical care program.

The study was made and reported by Frank F. Furstenberg, M.D., director of the medical care clinic, Sinai Hospital, Baltimore, Md., Harry Goldberg, chief pharmacist at the hospital, Matthew Taback, M.A., director of the bureau of biostatistics, Baltimore City Health Department, and J. Wilfrid Davis, M.D., director of the medical care section of the department.

Drug Costs

Examination of 1,034 prescriptions, a 1-percent random sample of those written under the program between July 1950 and July 1951, revealed that over 55 percent were for proprietary drugs, the investiga-

tors stated. They estimated that an average of \$16.32 per 100 proprietary prescriptions could have been saved if official preparations having identical chemical, physical, and therapeutic properties had been used instead, representing a 6-percent reduction in drug costs for that year.

From the beginning of the Baltimore City program, drug costs have constituted a significant portion of the total budget, amounting to 30 percent during the study year, Dr. Furstenberg and his associates explained. Since the program specifies few prescribing restrictions, examination of the drug problem was considered necessary for proper administration.

Quality of Service

The study also provided data which, they said, permits certain inferences concerning the quality of medical care being provided. Among these data were the following:

Thirty-seven percent of the prescriptions were for "therapeutically nonacceptable" preparations, using as the criterion of acceptability the inclusion of the preparations in the United States Pharmacopeia, the National Formulary, or the American Medical Association's New and Nonofficial Remedies.

Forty-four percent of the prescriptions from private practice were for nonacceptable preparations, but only slightly more than 16 percent of those written in the hospital were so classified.

Refills

Fourteen of the prescriptions provided therapy for nearly a year; 31 percent of the prescriptions for sedatives, other than phenobarbital, allowed two or more refills.

Predominant types of prescriptions were for cardiac, respiratory, and gastrointestinal preparations, the preparations being classified according to probable physiological action. Analgesics ranked fourth and sedatives fifth.

Over 50 percent of the prescriptions for insulin and allergy preparations were written in the hospital medical care clinics or out-patient departments, whereas tonic and placebo prescribing was rare in these places.

Limitations Recommended

Dr. Furstenberg and his colleagues recommended, in view of these findings, that consideration be given to limiting the duration of therapy allowed on a single prescription and the number of refills allowed. Unlimited prescribing may be an important factor both in high drug costs and in questionable medical practices, they indicated.

They suggested that prescribing practices might be improved by including, in a public medical care program, education in prescription writing for the participating physicians. The use of a formulary, they said, would effect immediate economies.

Statistical Procedure Charts Fee Pattern

The administrative control of payments made to physicians on a fee-for-service basis can be accomplished by use of statistical methods, Charles

A. Metzner, Ph.D., research associate, S. J. Axelrod, M.D., associate professor, and J. H. Sloss, M.A., research assistant, all of the bureau of public health economics, University of Michigan School of Public Health, Ann Arbor, found in a study of a comprehensive prepayment plan.

Payment Methods

Expansion of medical care insurance plans will likely be based on services embodying the fee-for-service method of payment, and the problem of control of payments to physicians is increasing in importance, the Michigan investigators stated. Financial stability of any medical care program demands that receipts exceed the expenditures, they said, and in a fee-for-service plan, unlike the automatically controlled capitation and salaried systems, no inherent limit is set on the physician's income.

Analysis of available data showed abuse of services by subscribers to be minor, whether measured in terms of excessive demands for service, "shopping around" for physicians, unreasonable requests for medical care outside regular hours, or overutilization of services. The investigators therefore concentrated their study on the control of abuse by physicians in "rendering fees." Heretofore, no objective method of

federal grants-in-aid for public health services

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- 1918 Chamberlain-Kahn Act
- 1921 Sheppard-Towner Act
- 1935 Social Security Act
Titles V and VI
- 1938 Venereal Disease Control Act
- 1944 Grants for tuberculosis control
- 1946 National Mental Health Act
Hospital Survey and Construction Act
- 1947 Grants for cancer control
- 1948 National Heart Act
Water Pollution Control Act

Financial grants-in-aid from Federal to State and thence to local governments—plus loan of personnel and technical assistance—proved a significant catalyst in the growth of services and facilities for the safeguarding and promoting of the public's health.

reviewing physician-submitted bills for acceptability as "allowed fees" has been employed, they said. Reviewing committees or physicians show personal judgments; prior authorization of service is cumbersome; proration implies inadequate financing.

Billing Practices

Data from record cards of 110,000 members of a comprehensive fee-for-service medical care plan for the months May 1950, March 1951, and January 1952 were used in the study to determine whether there was a uniform billing pattern. General practitioners were chosen from the rest of the physicians as being a homogenous group: 108 for May 1950, 126 for March 1951, and 131 for January 1952.

Using both a graphical and an arithmetical procedure, they found that there is describable uniformity of practices among physicians included in the study and that the variation provides a basis for detecting unlikely departures from uniform patterns of practice. The unexpectedly large deviations indicated the usefulness of this analysis for control purposes. Both procedures gave substantially the same results; and there was a high degree of consistency from month to month, even though the months were separated by almost a year. Over-billing was readily spotted by both procedures. For the number of physicians in the sample used, the calculations for each procedure for each month required approximately 4 hours of clerical work.

These statistical procedures are objective, time-saving, and effective administrative tools for control of physicians' service plans on fee-for-service basis in medical care programs, the investigators believe.

Opinions of Physicians About EMIC Reported

An analysis, unique in that it is apparently the only one so far re-

corded of the opinions of physicians who actually cared for emergency maternity and infant care patients in a community, was reported by Leona Baumgartner, M.D., assistant commissioner of the New York City Health Department; Helen M. Wallace, M.D., director, bureau of handicapped children, New York City Department of Health; and Myron E. Wegman, M.D., chief of the division of education and training services, Pan American Sanitary Bureau, Washington, D. C.

All 5,575 physicians actually caring for emergency maternity and infant care patients during World War II in New York City were solicited for their opinions through a questionnaire calling for "yes", "no", or "no opinion" responses. About 50 percent of all physicians responded, a group considered reasonably representative.

The similarity of the data collected, and the unusually large number of returns "make it sound to conclude that the study reflects reasonably accurately the opinion of all the physicians in the community who cared for EMIC patients," the authors believe.

Tally of Answers

Major findings reported were:

About 90 percent thought the program reached its objective of raising morale.

More than 90 percent thought that the functioning of the plan had not interfered with the patient-physician relationship.

Of the small number who thought the plan had made a change in the patient-physician relationship, almost one-fifth thought the change one of improvement. Pediatricians seemed more likely to think the relationship better.

More than 75 percent were satisfied with the procedure and general administration.

More than 90 percent were satisfied with the method of payment directly to the physician.

Less than 1 percent would have

preferred a cash payment to the patient.

There was more positive approval for medical consultation by specialists and for services of visiting nurses than for special nursing service.

The greatest dissatisfaction was in the amount of the fee paid, particularly the obstetric fee.

Hospital Care Doubles For 65's and Over

Nearly twice as much general hospital care per capita as the population under 65 received, was received in 1951 by persons 65 and over, I. S. Falk, Ph.D., and Agnes W. Brewster, respectively director and medical economist in the Division of Research and Statistics, Social Security Administration, told a joint session with the American Association of Hospital Consultants.

In studying the insecurity which the aging experience from illness, Dr. Falk and Mrs. Brewster gathered information on ownership of hospitalization insurance in March 1952, amount of hospital care received in 1951, and how the aged paid their hospital bills. Added to the March 1952 interview questionnaire of the Current Population Survey were questions to be asked concerning everyone 65 and over in the 25,000 representative households sampled.

The researchers also collected fragmentary data from published documents and turned to Blue Cross and retirement plans, public assistance agencies, and other age-specific records for estimates and ranges useful as first approximations.

Less Insurance

Comparing survey findings with those from diverse insurance and noninsurance experiences, Dr. Falk and Mrs. Brewster observed:

About 26 percent of the noninstitutional population 65 and over reported having some hospitalization insurance in March 1952—a contrast

with the 60 percent ownership among persons under 65. The survey confirms that older persons have lagged far behind the general population in acquiring insurance protection against hospital costs. Among the older citizens insurance ownership is heavily concentrated in the 65 to 69 age group, those still in the labor force, white persons, males, and urban residents.

As in other age groups, short-term hospitalization predominated among the aging, but their relatively few long-term cases accounted for a large proportion of all days of hospital care they received. This invites review of current hospitalization practices and of the present use of general hospital beds, personnel, and funds for the care of long-term cases.

Among persons 65 and over, the frequency of hospitalization and the amount of hospital care varies markedly according to insured status. Insured persons, presumably better than average risks, had higher hospital admission rates but used fewer hospital days per 1,000 persons than those without insurance. The non-insured had fewer admissions but received a larger amount of hospital care. Thus, financial burden was disproportionately heavy on those least equipped to bear it, for the noninsured constitute three-fourths of all the aged in the surveyed population.

Who Paid the Bills

In the group of noninstitutional aged, 38 percent paid the hospital bills themselves; 14 percent had hospital care without charges; 13 percent paid through their insurance. Relatives and others paid the bills for 12 percent. Twenty-four percent had to call on more than one financial source. The insured used multiple sources of payment in more than half the instances of hospitalization. Among the noninsured, 55 percent met the bill entirely by themselves.

Voluntary insurance may further expand enrollment among the aged

and the comprehensiveness of protection. But the retired status of large proportions of those 65 and over and the meager financial resources of most suggest limits beyond which self-supporting voluntary insurance cannot go in providing the aged with financial security against hospital and other costs of illness.

Prepayment and other group plans show hospitalization rates for their aging members as both higher and lower than those found for the whole aging population, emphasizing that geographic location and selection factors radically affect experience rates, and suggest that hospitalization rates are lower where prepayment applies to a broad spectrum of medical services and not merely to hospital care. If this observation is supported by further experience, it suggests an opportunity for future reduction in the cost of hospital care without sacrifice of adequacy.

Saskatchewan Stabilizes Hospital Incomes

A hospital payment plan that Saskatchewan health officials believe will resolve earlier inequities has been devised for the hospital care insurance program of that Canadian province.

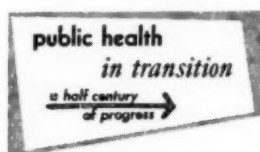
Reporting on the three different methods of payment during the 6-year experience of the Saskatchewan Hospital Services Plan were F. B. Roth, M.D., deputy minister, and F. D. Mott, M.D., formerly deputy minister, of the Saskatchewan Department of Public Health; G. W. Myers, C.A., executive director of the Saskatchewan Hospital Services Plan; and L. S. Rosenfeld, M.D., formerly vice chairman of the Health Services Planning Commission.

The 163 public general hospitals and nursing homes in the program now get semimonthly lump sums to pay for the total fixed expenses such as depreciation, power plant costs, and salaries. The payments are slightly higher than the calculated fixed expenses. Additional per diem payments covering slightly less than the costs that vary with occupancy, such as food, laundry, and drugs, are made on receipt of individual accounts from the hospitals.

Income Stabilized

This system has stabilized hospital income by leveling out income fluctuations, the officials reported. It has also removed incentive to overcrowd hospitals for the purpose of adding to revenues, a condition inherent under a patient-day system of payment, they said.

A system of payment tried dur-



This album of illustrations serves to recall some of the early forward steps and key advances in the practice of public health since 1900. Those incidents and activities presented are, of course, only symbolic of the many; definitive historical evaluation is not implied. Next month in Part II current status and emerging problems are outlined.

ing the first year of the plan was designed to reimburse hospitals according to their ability to provide a complete service and also to stimulate improvement in equipment and personnel, they said. Under this system some hospitals were making substantial profits, a few were breaking even, but many were incurring deficits.

When it became evident that there is no close relationship between the quality of service and the cost of providing it, this system was superseded by per diem payments based on estimated costs, the officials reported.

Under this system the in-patient hospital revenues fluctuated almost directly with seasonal variations in occupancy, thus creating some difficulty in financing fixed expenses during low occupancy periods, the officials stated. They also pointed out that some hospitals found inclusive per diem rates an incentive to overcrowd, because a drop in occupancy meant a corresponding decrease in revenue.

Plan Sound and Workable

Both the hospitals and plan officials are pleased with the present method, they state, terming it "a sound, workable, equitable method of remuneration of hospitals for coverage under a comprehensive hospital insurance program."

The Saskatchewan Hospital Service Plan, administered by the provincial Department of Public Health in consultation with representatives of the hospitals, makes essential hospital care available on a free choice basis. It covers about 94 percent of the population in the province, or about 780,000 persons. The program is financed through obligatory personal premiums, except for the indigent, and through supplementary provincial taxation. The benefits include minimal or public ward accommodation and virtually the entire range of available in-patient service.

Scientific, Group, and Community Approaches to Obesity

The problems relating to obesity, benefits to be secured through weight reduction by overweight individuals, and various approaches to weight control were considered in a panel discussion before the food and nutrition section. Five of the papers presented are summarized here. Another paper dealing with the approach to weight control was read to a combined session of the food and nutrition and health officers section.

Louisville's Experience Points Up Obstacles

The many followers of reducing fads and the increase in sales of over-the-counter obesity drugs and dietetic foods reveal an ignorance of the obesity problem as well as general interest in its control.

This observation was made in reporting the weight control project sponsored in 1951 by the Louisville, Ky., Nutrition Committee. Four of its members who presented the committee's findings are: John S. Llewellyn, M.D., Louisville Heart Association; Emily Bennett, B.S., executive director, Central Dairy Council; Mary M. Hurley, M.P.H., health educator, Louisville and Jefferson County Board of Health; and Mildred Neff, M.A., director, division of nutrition, Kentucky State Health Department. They reported:

The instructors of the committee's weight control classes and education program were faculty members of the University of Louisville School of Medicine, teachers and community professional workers in economics, nutrition, health and physical education, and directors of insurance companies.

A physician explained the undesirable effects of rapid weight loss, use of unapproved drugs, and the fads sometimes offered in the daily papers. Lectures were held on topics including reasons for overweight, diet, the advantages and disadvantages of exercise, and the fallacy of exercise as a substitute for decreased caloric intake, and the rewards for normal weight.

Results of Program

Encouraging was the average weight loss per person of those who attended classes during the first 3 weeks. Seventy-seven (96.2 percent) lost weight in significant amounts, two maintained initial weight, and one gained weight. For this group the weight loss ranged between $\frac{1}{2}$ and $12\frac{1}{4}$ pounds for an average of 5 pounds per person during the first 3 weeks of the classes.

At the end of 26 weeks, 19 of the original class were present. Of these, 79 percent had lost weight, 3 persons had gained, and 1 showed no change.

Attendance records were discouraging, however, in spite of excellent publicity through all media of information. This indicates inertia inherently present in the public for community service. More interest probably could be obtained by appealing to the obese person individually than collectively.

Less than 1 percent of the total attendance of the classes were men. It seems advisable to offer sex-segregated classes so that men will participate. Overweight is less harmful to women than to men so far as longevity is concerned, but women are more inclined to correct overweight than men.

Great interest was shown in the graphic displays prepared by the insurance companies which statistically depicted analyses of obesity.

The obese person must be properly motivated to reduce, the committee members emphasized. In future programs therefore, the psychotherapeutic approach is to be incorporated as an integral part of the classes in hope that results will be better.

Obesity Is a Factor In Arteriosclerosis

Deaths from arteriosclerosis occur earlier in the overweight than in the nonobese population. This one fact about arteriosclerosis stands out with clarity, Norman Jolliffe, M.D., director of the bureau of nutrition, New York City Department of Health, stated.

The only advice that can now be offered with confidence on prevention of arteriosclerosis and related diseases is "never become overweight, and if overweight, reduce and stay reduced," Dr. Jolliffe said. By this means alone, he believes Americans could increase normal life expectancy by 1, 2, or perhaps even 4 years.

Dr. Jolliffe termed arteriosclerosis and the degenerative diseases as the health problem to be reckoned with in this day of an older population, when 90 percent of the people will live to and beyond the age of 45 and the life expectancy is 67.6.

People are eating as much now as they did in 1900, he said. The daily calorie consumption per person is still 3,100. As an older, less hard-working population, they should be eating less—2,870 calories per day. The need for calories decreases about 7.5 percent for each 10 years after age 25, and with easier transportation and labor-saving devices, less energy is being expended, he explained.

It has been estimated that 25 to 30 percent of the population is over the desirable weight, Dr. Jolliffe said.

Basic Principles For Reducing

He outlined three basic principles that must be applied if America's

number one health problem, obesity, is to be solved:

First, obesity is invariably caused by a greater intake of calories in food than expenditure of calories as energy. This statement leaves no "out" for the overeater who sees himself as an exception to the rule.

Second, loss of excess fat is directly proportionate to the calorie deficit, which can be obtained either by increasing the calorie expenditure or by decreasing the calorie intake. To lose 2 pounds the obese person must eat 1,000 calories less a day for a week. The equivalent in calorie expenditure, or exercise, would be 5 extra hours of walking.

Third, the reducing diet should form the basis of dietary reeducation so that proper eating habits will continue after the desired loss of weight. Skipping meals or following trick or rigid diets the person does not really understand does not establish good dietary habits. People should learn food values and how to count calories.

Five Research Methods Determine Obesity

In a discussion on criteria of overweight, John H. Browne, M.D., of the New York State Department of Health's bureau of nutrition, described five research methods of determining obesity.

With anthropometric instruments, take precise measurements of the body between designated bony landmarks and determine circumference and diameter of the trunk and extremities.

X-ray the leg or other parts of the body, cut the film along the lines of shadow of bone, muscle, and subcutaneous tissue, and skin, and weigh the pieces of film; or measure the area of the various shadows.

Determine the creatinine coefficient (said to be uncertain method).

Estimate total body fat from body water.

Determine the specific gravity of the body by weighing in air and under water; the percentage of fat can then be found by referring to tables developed by Rathbun and Pace.

Practical Methods

In everyday practice, however, simply looking at the patient is usually sufficient to determine overweight, Dr. Browne stated. The scientific techniques described are expected to add to our knowledge of precise determination of overweight and to aid in studying groups of people with regard to caloric nutritional status.

In total weight measurement, the amount of muscle and bone must be considered because of variation among individuals, Dr. Browne pointed out. By the scales, a professional football player may seem to be 30 pounds overweight, whereas a muscularly underdeveloped individual may be within the average for his height and still have an excess of fat, he explained.

Reduction in Weight May Lengthen Life

Although weight reduction is not a panacea for all of the difficulties of the overweight person, it can bring him substantial physical, psychological, social, and economic benefits, make him look and feel better, and probably lengthen his life, commented Louis I. Dublin, Ph.D., second vice president and statistician, Metropolitan Life Insurance Co.

Nevertheless, there is a "surprising dearth of information on the benefits of reducing" due to difficulty in assembling the facts and the needed long-term follow-up, he stated.

A study of 25,000 men and 25,000 women who, because of obesity, were charged an extra premium by his company revealed nothing start-

lingly new, he said. Mortality was 50 percent higher among the obese than among "standard insurance risks." However, in a special study of those among the overweight who had reduced, the death rate was found to be one-third lower for women and one-fifth lower for men than the rate for the overweight group, he reported.

Diseases Among the Obese

Diseases of the cardiovascular-renal system, diabetes, and disorders of the liver and biliary tract cause excess mortality in the obese, Dr. Dublin stated. Various studies have also shown that gallstones, gout, vascular complications, hypertension, asthma, and bronchitis have a higher incidence among the overweight, he noted. The stillbirth rate among obese women is nearly double the rate among women of normal weight.

Dr. Dublin observed that overweight may seriously handicap individuals, regardless of age or sex, in their personal lives, in employment, and in social relations. A fat child ridiculed by other children is likely to seek satisfaction in sedentary recreation and in eating.

Weight Control Groups Studied by Conference

The group approach gives promise of achieving a program of weight control, but it is not the answer to all of the problems.

This was the conclusion reached by participants in a Conference on the Group Approach to Weight Control held in Washington in June 1952 as reported by Malcolm J. Ford, M.D. Dr. Ford is chief of the program development branch, Division of Chronic Disease and Tuberculosis of the Public Health Service.

The purpose of the conference, as stated by Dr. Ford, was to bring together people with experience in the

group approach to weight control and to find out the opinions they hold in common as well as the points of difference.

The conference thought that weight control groups should be: homogenous in terms of age, background, and degree of overweight of participants; heterogenous in terms of personality; small in size (10 or 12 ideal); screened to eliminate those not likely to benefit from the experience and those with severe psychological problems; assembled in short sessions not too frequently held (1 hour once a week, tapering off to once a month); supervised by medical personnel, but leader need not have any particular type of professional training.

Some believed that group members should weigh in at each session. Others felt that this was unimportant or even detrimental. Some thought that proper nutritional information alone was all that people needed; others stressed the psychological aspect of weight reduction.

Factors Leading to Obesity

Although not the primary subject of the conference, the factors that lead to obesity were discussed. The discussants agreed:

Some people have special difficulty in hewing to a dietary line, such as those with certain ethnic or cultural food patterns.

People with little money tend to buy the cheaper carbohydrates.

Mothers after delivery fail to lose excess weight gained during pregnancy.

Emotional problems alone may be responsible for overeating.

The conference, Dr. Ford said, recommended that other controlled studies be carried on to investigate the effectiveness of the group approach as compared to the individual approach to weight control. First results from experimentation with the method were inconclusive but interesting. Before the method is advocated unreservedly, more scientific observations are needed to clear up unanswered questions.

Community Can Attack Problem of Obesity

Obesity, a threat to health and life expectancy, is an important public health problem which the community can attack, suggested W. P. Shepard, M.D., third vice president of the Metropolitan Life Insurance Co., San Francisco.

Overweight afflicts approximately 15 million people in the United States, making them especially susceptible to heart disease, kidney disease, apoplexy, diabetes, and other degenerative diseases, he said, adding that people become interested in weight control as they become aware of the health hazard of overweight. The individual's responsibility for control of his own weight must be developed by a continuing health education program.

Leadership for the community weight control program can be assumed by the major local health agency, health council, or officials, Dr. Shepard pointed out. Professional people, aware of the importance of correct weight, are valuable collaborators, he said. In addition those already interested in "reducing," can be utilized in program planning.

Arouse Public Interest

Communities will differ in resources, leadership, and interested groups, said Dr. Shepard. To arouse public interest and to stimulate individual responsibility, agencies participating in the weight control program should include: health departments, heart associations, hospitals, schools, clubs, church groups, civic organizations, and professional societies of physicians, nurses, and home economists. Sponsored programs can be public panel discussions, club meetings, movies on health subjects, symposiums and institutes for organization members, group therapy, home visits by professional health workers, and pamphlets, posters, and exhibits widely distributed and regularly issued.

Cooperative Group Action by Parents of the Handicapped

How parents can help their handicapped children, what can be done to prevent other and unborn children from being handicapped, the various difficulties faced by the parents themselves—these and similar problems were discussed before diverse sections of the conference.

Group counseling was the keynote. It was felt that the more information received by the parents, the more counseling provided for understanding their own and their children's problems, the better equipped they would be to promote a happier and more constructive life for all concerned.

Group Discussion Enhances Child Health Interviews

To the traditional individual interview procedure of the child health conference has been added the group discussion method, reported Samuel M. Wishik, M.D., M.P.H., professor of maternal and child health, University of Pittsburgh Graduate School of Public Health. He told a joint session with the Conference for Health Council Work about administrative experimentation in 1950-51 with the new technique at the Lillian Wald Child Health Station, one of the 80 stations operated by the New York City Health Department.

Dr. Wishik believes that the individual approach and the group approach can be satisfactorily combined. "It is conceivable," he said, "that the group method might economize in use of professional staff time. If certain common questions

can be answered for groups of mothers effectively, it might not be necessary to go over the same material separately with each mother. Furthermore, if certain common problems are put across with mothers in general, it may make it possible for the professional staff to devote its time in the individual interviews to other phases of parent counseling."

Dr. Wishik admitted that in its early stages group discussion is an additional task for the professional staff, requiring more rather than less time.

He remarked that the group method of idea exchange should aid in effective counseling because mothers "support and bolster" each other in the group and are more receptive to changes in child-training when they receive "ideas from their peers rather than from a professional group." Mothers, he said, are more strengthened by group discussions with other mothers in changing their practices and in substantiating some of their convictions about existing practices.

Professional Attitudes

The group technique may develop a change in staff attitudes and methods if the staff member can acquire from group discussion the habit of "listening more and of getting a more accurate impression and more intimate feeling of the experiences and points of view as well as problems of the mothers," he commented. Dr. Wishik hoped that such an attitude would carry over into the individual interview relationships between the physician or nurse and the mothers. He indicated a possible application of the group method to the private office practice of pediatricians.

These factors were selected by Dr. Wishik for successful free group discussion:

1. Skill of the discussion leader and nature of the participation of the physician and nurse.
2. Smooth functioning of gathering of mothers: avoidance of undue waiting time and noninterruption of discussion by outside factors.
3. Appropriateness of the topics to the interest of the mothers.
4. Size of the group.
5. Personality of the participating mothers.

New York Experience

At Lillian Wald, he said, 25 minutes were set aside on Thursday mornings at 10 o'clock for 12-15 mothers to meet in a large room separate from the waiting room and the children's play area. The time chosen permitted parents to have their individual interviews in the preceding hour. Seats were arranged in an informal circle. While no children were included, they had free access to their mothers from the play area where they were kept under supervision.

Parents with similar backgrounds and common problems and unhampered by language difficulties were grouped in conference periods on separate Thursdays according to the age of their youngest child. A spread in the children's ages within each span was considered desirable so that the mother who had already met a situation, such as introducing the first solid foods, could relate her experiences.

Sample topics for mothers with children from 10 to 12 months included: thumb sucking, colds, going to sleep, fear of strangers, clinging to parents, shoes, walking, weaning, bowel training, and feeding. Similarly appropriate topics were chosen for the other age spans: birth to 6 weeks, 7 weeks to 3 months, 4 to 6 months, and 7 to 9 months.

When the regular station physician and nurse participate in discussions, they can interject helpful questions, Dr. Wishik commented.

"Physicians and nurses repeatedly evidenced surprise that mothers raised questions which they had not asked in individual conferences," he noted. "When the doctor recommends something different from what was taught several years ago, a mother can ask the reason for the change in recommendation," giving him an opportunity to interpret the reasons for changes in teaching.

Parents Attend Classes On Care of Premature

Although the "premature program" is still new, it has been extremely valuable in helping parents to give better care to premature babies, Gellestrina DiMaggio, M.N., and Marguerite B. Gelinas, B.S., M.S.S.W., told the maternal and child health, public education, and public health nursing sections of the American Public Health Association and the Conference for Health Council Work.

Miss DiMaggio is administrative supervisor of children's service, Grace-New Haven Community Hospital, and clinical instructor in the Yale School of Nursing; Mrs. Gelinas is a pediatric social worker at the Grace-New Haven Community Hospital.

The key part of the program, they said, is the monthly group meetings held at the hospital, when parents, grandparents, or others assisting in the care of the baby are encouraged to ask questions and to discuss their problems.

The meetings are informal, they continued. The children's ward resident presides and a nurse and social worker help in the discussion. The nurse tells about the nursing care of the baby in the premature nursery, answers questions about his care after he is discharged, and encourages the parents to come in at any time to care for and get acquainted with their baby. The speaker stressed the importance of the visiting nurse in giving the

mother a sense of security in bridging the gap between hospital and home.

Parents' Queries Answered

The social worker described her functions, among which is the encouraging of parents to bring before the group questions they have asked her. These most often concern the reason the baby was premature, what can be expected in his growth and development, the danger of overprotection, preparation of other children at home for the advent of the baby, effect of the parents' feelings upon their care of the baby, insecurity in caring for a small infant, and fear that he may be fragile or that they may expect too much of him.

Parents feel that they have adjusted to their baby more easily as a result of these group discussions, they said, and the staff has learned a great deal, including the fact that more than a simple explanation about prematurity is needed by parents, and that the parents work more effectively with the hospital after attending meetings.

Mentally Retarded Aided By Group Methods

When one New Jersey mother advertised a few years ago that she had a mentally retarded child and asked other mothers to phone her about discussing their common problem, she sparked a remarkable group method, E. Louise H. Porter, Ph.D., registrar at the Southbury Training School, Southbury, Conn., told the joint session with the Conference for Health Council Work.

The New Jersey parents met, sought professional advice, and set off a chain of national, State, and local organizations to help overcome parental and social misunderstanding of mentally defective children, Dr. Porter noted.

"I doubt if a better group method exists," she said. "It is dynamic

because it derives from the long-suppressed feelings of parents who always believed, though silently and alone, that something should be done. To be sure, a few parents never had the belief, and some parents had lost it when they were convinced that their child should be institutionalized and forgotten. These organizations of parents have given their members faith in themselves and their children . . . This wholesome attitude engenders an improvement in the attitude of others."

The Children Improve

Effects of the new parental attitude on the children themselves are far-reaching, she continued. "Some children are enjoying the company of others of their own mental level for the first time in their lives. Others are going out into the world from which they were previously separated by shame. Still others are attending classes though they had formerly been excluded from school as noneducable. A few others are obtaining jobs because intolerance of slowness has given way in a few places. This is only the beginning."

The group method has spread to institutions too. "Previously parents traveled from many geographic areas to visit their children and returned quickly to their separate homes," Dr. Porter added. "Now they not only visit their children but remain to meet with other parents for group discussions."

Dr. Porter commented that through appreciation of an institution's problems parents have provided "the administration with a bulwark of backing when outside influences try to alter the school's carefully developed philosophy. Parents drawn into these groups have a new purpose in life, and those whose children have been living in the institution for years wish they had been wise enough to start discussions long ago. As if to compensate for the years they lost, many of them join the community groups and help bring understanding to other parents.

Group discussion is leading to action as parents realize their power as a group. Action is what the field of mental deficiency needs to obtain funds for special classes and recreational opportunities, to convince industry that the more capable mentally deficient are good employment risks, and to stimulate the professions of medicine, psychiatry, education, psychology, and social work to train their specialists for wise guidance of the mentally retarded child and his family, Dr. Porter stressed.

Own Problems Solved By Parent Groups

Intelligent group counseling by psychologists and medical social workers with parents of cerebral palsied children helps to eliminate many of the parents' misconceptions about cerebral palsy and aids them to a fuller understanding of their part in their children's development, said Harry V. Bice, Ph.D., consulting psychologist with the Bureau of Crippled Children, New Jersey State Department of Health.

Such a group counseling program was inaugurated in New Jersey, Dr. Bice reported, because parents did not feel they received adequate information about the complex nature of cerebral palsy from the professional physicians, nurses, and therapists treating their handicapped children.

He said many parents needed release from emotional tensions, as well as pertinent information about their children. They frequently expressed resentment, complaining either that they were unjustly burdened with an afflicted child or that professional personnel were not competently treating the child. To meet this dual need throughout the State, counseling groups were organized which were small enough to enable the counselor to know each child and his particular problems and to

provide parents with an opportunity for self-expression.

Subtlety in Counseling

Nondirective group counseling was emphasized, with the counselor attempting to remain in the background while parents discussed and offered their own solutions to problems that were presented. Even when it was necessary that the counselor give technical information, he tried to draw from the parents their own points of view.

Best results were achieved, continued Dr. Bice, when fathers and mothers were not both present at the same meeting, for while a mother might speak freely of tension between herself and her husband when only other mothers were present, she was unlikely to do so if he or other men were at the meeting. Therefore, five separate meetings were conducted for each group, with a sixth and summary meeting being participated in by both groups. More women than men attended the afternoon meetings, he said, and recommended that meetings for men be held at night.

Generally, Dr. Bice concluded, the parents discussed candidly their feelings of embarrassment, frustration, and guilt toward their children and contributed greatly to each other in comparisons of disciplinary and training methods.

That "Different" Feeling Mitigated by Groups

Four advantages of informal group discussions among parents of chronically ill children were outlined by Luigi Luzzatti, M.D., at a combined session of the maternal and child health, public health nursing, and public health education sections and the Conference for Health Council Work.

Dr. Luzzatti, chief, department of medicine, Children's Hospital of East

Bay, Oakland, Calif., said that the discussions held in the metabolic clinic for parents of diabetic children have provided the parents with accurate information about the disease; have helped them overcome the feeling that they or their children are "different" or "alone"; have helped to release parental anxieties; and have provided the professional staff with information about the parents and children.

Pointing out that the care of a child with chronic disease requires more than regulation of the disease, he maintained that there are limitations as to how much can be accomplished by the one-to-one contact between physician and parent in the doctor's office or clinic. Admitting this contact is useful, he expressed the belief that group discussions can significantly supplement it.

Information and Reassurance

Participating in the group discussions described by Dr. Luzzatti were the professional personnel who see the parents and children individually in the clinic and one or both of the parents of 13 of the 20 children attending the clinic.

Discussions centered generally around assigned topics such as physiopathology of carbohydrate metabolism and diabetes, management of the diabetic child, psychological adjustment to the disease, and economic problems of care. Many of the questions raised by parents stemmed from ignorance of a particular aspect of the diseases; others from a simple need for reassurance.

In retrospect, Dr. Luzzatti said, it is believed that the discussion would have been more valuable had more stress been placed on the individual problems and less on imparting information on a planned basis. "We came to feel," he stated, "that only out of an answer to their own individual problems would parents derive the ability to accept the condition and to reassure each other."

Studies of Spread Patterns Of Infectious Hepatitis

Observations on infectious hepatitis in a Baltimore housing project suggest the use of gamma globulin to stop an outbreak. Further observations in Philadelphia confirm data indicating the fecal-oral type of spread of the agent. In National Microbiological Institute investigations, heat of 60° C. fails to sterilize plasma infected with the agent of homologous serum hepatitis.

One of these studies was presented to the epidemiology section and the other two to the joint session of that section with the laboratory section.

Radial Pattern Revealed In Hepatitis Outbreak

The nearer a person lives to a home affected by infectious hepatitis, the greater is his risk of contracting the illness.

This was the opinion expressed by Abraham Lillienfeld, M.D., Irwin Bross, Ph.D., and Philip E. Sartwell, M.D., of the departments of epidemiology and biostatistics, Johns Hopkins University School of Hygiene and Public Health.

Focus of Infection

Basing their conclusions on an intensive 2-month study of an outbreak of infectious hepatitis in a Baltimore housing project in 1951, the authors stated that the disease seemed to spread from a focus near the center of the project in a radial pattern often seen in outbreaks of poliomyelitis or measles.

The Baltimore City Hospitals, located near the project of row

houses, alerted the city health department to the outbreak in July 1951. Approximately 30 cases were reported from April through September although reporting of jaundice was not required. The study was initiated to determine the number of cases and the distribution according to various characteristics of the industrial population.

Method of Attack

Interviews with residents and their physicians established that there had been 117 mild cases of infectious hepatitis among the 3,970 residents during the year prior to the study. Eight cases without jaundice were not included in the study. The general attack rate was 2.9 percent, the highest occurring in the 5-14 age group. Females had a higher attack rate than males.

Examination of school attendance records, income status, duration of residence in the city and in the project, and the history of parenteral injections did not implicate these factors in the outbreak. In fact, newcomers to the project had a lower attack rate than others, contrary to the observations made on military populations.

During the outbreak, gamma globulin was offered to some of the persons of the affected households. The total secondary attack rate for those not receiving gamma globulin was 8.8 percent, which is considerably lower than the secondary attack rate reported in other outbreaks. The attack rate among those who received the globulin was 1.4 percent.

The expected seasonal decrease was observed in the summer months with a decided increase occurring in the early autumn. Because of the pattern of distribution, the authors determined that the disease was transmitted by the fecal-oral route.

The observed pattern might be utilized as a basis for applying gamma globulin in civilian populations to stop an outbreak, the authors suggested. "In institutional outbreaks it is feasible to administer gamma globulin to all the inmates. Although this is impossible in civilian life, it would be feasible to administer gamma globulin to members of the households which are in close proximity to an already affected one since their risk appears to be greater than average."

Hepatitis Transmission Via Fecal-Oral Route

The failure of nurses in a Chicago orphanage to properly wash their hands after each change of infant diapers was a major source of infectious hepatitis in one of the classic institutional outbreaks.

Most of the essential epidemiological points gleaned from that outbreak were discussed by Joseph Stokes, Jr., M.D., professor of pediatrics of the School of Medicine of the University of Pennsylvania. In outlining the epidemic, which pointed to the fecal-oral route of transmission, he reported the following:

Peculiarly, the disease seemed to appear only in new student nurses shortly after they began their training and did not seem to appear in the children or other adults at the institution. The knowledge of the presence of the disease there since 1942, and the fact that new interns also had begun to contract the disease, began by 1948 to deter new interns and nurses from applying for admission.

Gamma Globulin Injected

After November 7, 1948, gamma globulin was injected as a palliative and diagnostic measure into all new student nurses upon admission. Just prior to that date, 42 of 144 incoming students had developed jaundice soon after admission. In the 36 nurses who received the gamma globulin injections no jaundice de-

veloped for the succeeding 10 months. One exception was noted—a nurse who received her globulin 2 days prior to onset, a fact which confirmed the continuing endemic nature of the disease.

Skin tests for the presence of virus in the stools of certain children were conducted and evaluated. An evaluation of orphanage personnel, a tracing of possible sources, and hepatic function tests on key children and adults were made.

The liver function tests pointed to the fourth and fifth floors as the locale of the diseased children—over 80 percent of the student nurses who developed jaundice during the period from January 1, 1946, to November 7, 1949, had done so within 3 weeks of entering or of leaving the fourth and fifth floors. None of the mothers contracted the disease even though they were exposed to contact with the student nurses and ate and drank the same food and water.

The gamma globulin injections were halted on September 1, 1949, at which time 20 new nurses were admitted, 9 of whom developed hepatitis.

By use of volunteers, the presence of active cases of hepatitis A or of intestinal carriers was demonstrated by testing stool preparations from two children who had symptoms and positive liver function tests.

Hand Washing Effective

Following careful instructions on hand-washing techniques, no jaundice has occurred even in the absence of gamma globulin since December 1949 to the present time.

The outbreak supports other data indicating hepatitis A has a fecal-oral type of spread and does not appear to spread by nasopharyngeal secretions. A respiratory route of transmission would have brought the disease to at least one of the mothers in the Chicago orphanage, and the simple improvement in the cleanliness of nurses would not have stopped the disease if it had a respiratory route of spread from child to nurse.

The incubation period of epidemics of this disease is from 20 to 35 days but may be increased by attenuation of, or decrease in the number of, viral bodies in the infective material.

Immunity Attained

Individuals can be chronically active cases and carry the virus in their stools. Gamma globulin, administered at least 7 days prior to expected onset, is effective, at least as a temporary protective agent, in doses as small as .01 ml. per pound body weight. There is the suggestion that passive immunity can be changed to passive-active immunity if the individual continues at risk during waning passive immunity.

It appears best to have experience with the virus at an early age since jaundice is rare in hepatitis cases in the youngest age groups. Recently developed skin tests suggest that the hepatitis A virus, like measles or mumps viruses, may be of uniform antigenic properties which produce permanent immunity.

Virus of Serum Hepatitis Survives Heat

Plasma infected with the agent of homologous serum hepatitis retains its ability to produce jaundice even after being heated at 60° C. for 4 hours, reported five researchers in the laboratory of biologics control, National Microbiological Institute, National Institutes of Health, Public Health Service.

The study from which this conclusion was made was described by Roderick Murray, M.D., William C. L. Diefenbach, M.D., Frank Ratner, M.D., and Nicholas C. Leone, M.D. It is one of several being conducted to determine the effectiveness of existing and proposed methods of sterilizing blood and blood products.

Volunteers Inoculated

According to the investigators' statements, the study involved the

inoculation of three groups of volunteers with samples from a pool of infected plasma: one group of 10 men was inoculated with 1.0 ml. of plasma which had been heated for 2 hours; a second group of the same number, with 1.0 ml. of plasma which had been treated for 4 hours; and a third group of 5 men, with 1.0 ml. of plasma which had remained at room temperature. The heating had been accomplished by suspending 10-ml. bottles containing 7 ml. of infected material in a water bath, with each bottle completely immersed. The water was constantly agitated and the temperature maintained at about 60° C.

Dr. Murray and his associates stated that three cases of frank jaundice and one showing clinical signs and symptoms of hepatitis but with no visible jaundice occurred in the group inoculated with plasma heated for 2 hours; three cases of frank jaundice and two cases showing abnormal laboratory findings occurred in the group which had received the plasma heated for 4 hours; and one case of frank hepatitis occurred in the group which had received the control material.

Health Hazard Guarded

Subjects participating in this and other studies, Dr. Murray and his colleagues explained, are inmates of Federal penitentiaries, over 21 years of age but below middle age, who volunteer for the experiments. Each volunteer is carefully screened by a review of his past medical history, a complete physical examination, and a battery of liver function tests. After inoculation with the test material, the subjects are examined weekly. They are questioned as to their health, observed closely for possible icterus, and examined carefully for the development of signs of hepatitis. In addition, the set of liver function tests is repeated. On development of sustained symptoms or abnormalities, the subject is hospitalized for observation and treatment.

The General Practitioner And Preventive Medicine

More and more the general practitioner is turning to preventive medicine, speakers told the joint APHA session of health officers and medical care sections with the Academy of Medicine of Cleveland and the Cuyahoga County Medical Society. The trend is evident in the physician's early training, in his office practice, and in his role in the community and its organized health programs.

General Practitioners Lead in Community

The general practitioner participates directly in a host of community health activities, declared Garry G. Bassett, M.D., health commissioner, city health department, Lakewood, Ohio. Allied with the local health and various nonofficial health agencies, he makes major contributions to such public health programs as recording vital statistics, communicable disease control, sanitation, maternal and child health activities, and health education and information, Dr. Bassett maintained.

Elaborating upon this thesis, the health commissioner noted that the health department depends upon the general practitioner to report all births and deaths which he attends. He is responsible for providing an accurate diagnosis of the cause of death, information which contributes to the defining and locating of local health problems.

Serves Community

The general practitioner is the main contributor to the registration of communicable diseases, Dr. Bassett continued. He plays a major

part in tuberculosis control programs, sometimes by aiding in conducting mass case-finding surveys and often by providing clinical management of the cases found in such surveys. The discovery of cases of venereal disease is frequently made by the private physician.

In improving the sanitation of his community, the general practitioner assists by reporting abnormal conditions that he encounters in his patients' homes and in local establishments. In providing maternal and child health services, the private physician can excel since he takes care of the mother and child in the home environment. In addition, he often donates his services to maternal and child health clinics.

Finally, Dr. Bassett stated, the general practitioner performs an important service in health education. With his intimate knowledge of the patient, he can see that information obtained from lectures, newspapers, or radio is properly interpreted. He can make the education effective for the individual.

Serves Public Health

The health commissioner pointed out also that the general practitioner is in an excellent position to influence the development of the health department. He is attended with open ears by the various law-making and appropriating bodies—his suggestions are given the utmost consideration. "Practically," Dr. Bassett said, "the health department is largely in his hands to make to his liking."

Along with such nonofficial agencies as the Heart Association, the Tuberculosis Association, the Cancer Society, the Red Cross, and National Foundation for Infantile Paralysis,

the private physician and the health department constitute the community health team, he concluded. Consideration of the facts usually reveals that "each is playing a good game," but each could probably play a better game with help from the others.

Prepaid Group Practice Benefits Family Doctor

By serving as an equal partner with specialists in prepaid group practice, the family physician can be restored to his proper place as the key figure in community medical care, and many of the professional and social "disabilities" under which he now labors can be eliminated, George Baehr, M.D., president and medical director of the Health Insurance Plan of Greater New York, stated.

The increasing trend of the medical profession to desert family practice for the specialties, Dr. Baehr suggested, is due chiefly to materialistic considerations. The specialist, he said, generally receives higher fees and enjoys more regular working hours. His social position within the medical fraternity is considered higher than the family physician's, and he usually has more free time for hospital work and educational, social, and recreational activities. Family physicians, he continued, have themselves adopted "a defeatist attitude by submissively accepting the title of general practitioner, which is generally used by the public to mean jack-of-all-trades in medicine and master of none."

Prepaid Group Practice

As an equal partner with the specialist in prepaid group practice, the family physician receives an annual income approaching that of the specialist, Dr. Baehr said. The absence of financial barriers enables him to utilize all the available professional services and facilities of the group for preventive medicine

and early disease detection and treatment. He enjoys regular working hours, liberal off-duty periods, regular vacations with pay, and at times sabbatical leave for special training. The Health Insurance Plan of Greater New York (HIP) is also considering a retirement program for all participating physicians, he reported.

Dr. Baehr continued that under HIP 30 such medical groups, comprising almost 400 family physicians and 550 specialists, now provide comprehensive medical care to 400,000 persons in New York City. Since 90 percent of the participating families have selected a permanent family physician whom they may use regularly without financial deterrents, he felt that a far more favorable opportunity exists for an intimate and continuing doctor-patient relationship than in "solo" fee-for-service practice among similar low or moderate income families.

"Perhaps the most significant experience with group practice under HIP," he concluded, "has been the growing awareness among the group directors and specialists that the family physicians are the keystone of this type of practice and that the quality of medical care which they provide determines the reputation and the growth potential of the medical group."

Baltimore Program Relies On Community Practitioner

By uncovering multiple instances of unsuspected disease and by restoring clients to the point of employability, the Baltimore City medical care program is sound public health and an economic advantage to the community, according to George W. Dana, M.D., director of the medical care clinic of The Johns Hopkins Hospital. The program, instituted in 1947, endorsed by the Baltimore City Medical Society, and financially supported by the State

legislature, provides continuous medical service to persons maintained by Baltimore's Department of Public Welfare, he said.

Dr. Dana told the joint session that the program, which is under the authority of the commissioner of health, affords the client his own participating medical practitioner, an affiliating hospital, and free drugs.

Clientele, in family units, are assigned to an affiliating hospital having its own complete medical care clinic and are given initial medical examinations, Dr. Dana stated. The clinic routinely forwards clinical reports to the client's physician and provides consultative and laboratory services at his request. Currently, the 24,500 Baltimore clients are receiving medical care service from 300 participating physicians, 59 of whom carry an assignment of 100 persons or more, he reported.

The community practitioner is the central figure in the program's concept of medical supply, Dr. Dana continued. Participation is voluntary and available to all Maryland

licensed practitioners. A physician expresses his interest to the medical care clinic directors of affiliating hospitals with which he desires association. He is paid under the capitation fee system at the rate of \$7 per client per year, providing home and office care at an average of 2.4 services per client per year.

Schools Can Educate For Useful Service

With "a broader concept of preventive medicine as to its environmental and social aspects, the medical school will more completely fulfill its function and responsibility in meeting the realities and demands of medical practice for today and tomorrow," Walter L. Bierring, M.D., commissioner of health of the Iowa State Health Department, told the joint session.

Because the practicing physician today works in his office or in the hospital more than in the home, he

Preventive medicine as practiced by the general practitioner is not limited to his office; it is found wherever he goes—in his daily practice, in his postgraduate studies, and in his civic activities through his community health council. Each decade preventive medicine occupies more of the general practitioner's time.

Without the cooperation of the general practitioners of America any preventive medical program, whether national, State, or local in character, is doomed to failure. Practicing physicians look to public health officials for leadership.

The general practitioner, however, should be led, not pushed. Continuous education is the key.

Public health is a specialty. Few general practitioners have the time or the training to do a good job in part-time public health work. Organized public health units with full-time personnel constitute the essence of good health protection.

—J. S. DETAR, M.D., Milan, Mich., speaker, House of Delegates, American Academy of General Practice; president, Michigan Health Council.

is no longer as familiar with the hereditary, family, home, personal, and economic environment of his patients as in the past and cannot judge the importance of these factors in relation to disease, Dr. Bierring said.

The result, he said, is that social workers and agencies rather than physicians are most concerned with the environmental and social implications of health. Therefore, he maintained, the general physician should be taught the importance of understanding the civic activities related to medicine, problems of school health, maternal and child health, family life, and environmental influences, not only that he may be more useful to his patients, but that he may serve his community throughout his professional life.

During the past half century great and beneficial changes have taken place in scientific investigation, medical practice, and specific curative medicine, the physician continued, and these changes have resulted in a corresponding evolution in methods of medical education.

Medical Education

Undergraduate medical education should not only lead to the best care of the sick, the prevention of disease, and the promotion of health, Dr. Bierring went on, but should also provide opportunity for developing and using knowledge of medicine as a whole through integration of basic and clinical sciences, wider application of clinico-pathological conferences, and greater emphasis on preventive medicine. Specialist training should be postponed to the graduate years.

In addition to the problems of preventive medicine, which include occupational diseases, malnutrition, maladjustment, psychoneurosis, social deficiencies, and health education, Dr. Bierring said, long-term or chronic diseases are now a large part of general practice.

Health officers, public health nursing, medical care, and industrial hygiene sections of the APHA joined to present a "Joseph W. Mountin Memorial Session" in

Cleveland. The texts in full are published in the January 1953 issue of the American Journal of Public Health. Excerpts from the texts follow.

"Advancing the Frontiers of Public Health"

Introduction

By Leonard A. Scheele, M.D.,
*Surgeon General,
Public Health Service*

"Six months before his death, Dr. Mountin participated in a symposium on the Arctic Health Research Center at a general staff meeting of the Public Health Service. His opening sentences may be taken as an epitome of his major contribution to public health.

"'It might seem incongruous,' he said in that deceptively hesitant manner we knew so well, 'that at the last staff meeting I appeared before you as an apologist for the aging and made a point of identifying myself with that group; now, 2 weeks later, I come again as an Arctic explorer. That incongruity is something I would like to make a point of.'

"Everyone who knew Joe Mountin would like to make a point of the amazing diversity of his interests. He might call it 'incongruity,' but the ripe fruit of his brilliant mind was this very recognition that whatever affects the health of man is the proper study and a proper field of public health action. With recognition went his complete identification with the problem. Joe Mountin had in a very real sense the curiosity and instant response that Judge Learned Hand has called 'magnificent meddling': the force that drives man onward in his quest for mastery of the world he lives in."

Local Health Department

By Hugh R. Leavell, M.D.,
*D.P.H., Professor of Public
Health Practice, Harvard Uni-
versity School of Public
Health*

"Joe Mountin's great contributions . . . were based on sound knowledge of health problems derived from a long and rich first-hand experience at all levels of government, and on certain personal qualities which characterized him. . . . His contributions in public health administration stemmed from a broad, dynamic, progressive concept of 'health' . . . [which] must depend on differences in time, place and problem. . . . He kept asking: How well suited is the orthodox program of health departments to the needs of the people? What role is the department willing to occupy in areas beyond its traditional interest? How well equipped are public health groups to carry such additional functions as they may be called upon to discharge?

"The history and development of local health units was well known to him, and many years ago he stated certain principles which should govern the organization of such units. . . . The governmental health department was of paramount importance in Mountin's eyes . . . the focal point of the community's health activity. It should contain the social perspective and the wealth of competency to be able to perceive the need; and it should have the

ability and the courage to take whatever action is necessary. . . .

"He did not conceive of the health department as doing the total health job . . . [and] although the health department should definitely not engage directly in all kinds of health activities, it should find ways to participate in each type. . . .

"Mountin appreciated the importance of understanding the private practitioner's problems and finding methods of work with him. . . . With increasing extension of public health activities into the field of personal health services, particularly in chronic disease control, he realized the importance of not going too fast and of carefully working out professional relationships. . . . If health departments were to do their job properly, Mountin thought they would need to work very closely with hospitals and other agencies providing medical care. . . ."

Chronic Disease and Aging

By Vlado A. Getting, M.D.,
D.P.H., *Commissioner, Massachusetts Department of Public Health*

"It is almost impossible to review the development of any program in public health in the past score of years without finding Joe's guiding hand somewhere in its development. He brought out the need of health departments to evaluate their programs carefully, to consider the characteristics of the total population they serve, saying that health is positive and that public health responsibility must be geared to promoting ever higher standards of human efficiency and satisfaction. . . . He reminds us that there has been phenomenal progress in the development of programs for children, and he suggests that the same type of approach as was used in studying the child and his needs is now needed for the mature and older members of the community. . . .

"While Dr. Mountin stimulated not only health departments but also

voluntary agencies to assume a vital role in the development of a community program for older people, he indicated that such a program must be a community program shared by all. . . . If the health department develops an understanding of the problems of the aged and arouses community interest, he was convinced that the health department need do only a small fraction of the total program itself, and that the community as a whole will awaken to its responsibility. . . ."

Regionalization

By John B. Grant, M.D., *Associate Director, Division of Medicine and Public Health, The Rockefeller Foundation*

"Joe Mountin's chief characteristic was the embodiment in his philosophy of a comprehensive horizontal rather than a vertical specialized approach to problems of public health. And another characteristic over the years was the manner in which earlier general principles were later amplified in detailed recommendations. . . .

"Organization is the cornerstone required for the advance of any frontier of public health. . . . Mountin considered that multiplicity of agencies was the chief evil to be attacked. The summation of his thinking was that this evil required regionalization under a single administration for its removal. His guiding principle was that enunciated by the British Ministry of Reconstruction in 1919: 'The first principles of good administration require that when a special function is to be undertaken, it shall be undertaken by one governing body for the whole community needing the service, and not for different sections of the community by several governing bodies.'

"The level of health services of the nation in 1975 will be proportionate to the degree that Mountin's recommendations are implemented

for integration of all services through regionalization under a single administration."

Medical Care

By Franz Goldmann, M.D.,
Associate Professor of Medical Care, Harvard University School of Public Health

"With creative imagination and common sense he crusaded for the continued adaptation of medicine to social needs and uses, and he had the courage to state and defend unorthodox views at a time when many others were aloof, if not hostile, to any proposal implying a change from chance to choice. Knowing that truth does not necessarily conquer by itself, he was untiring in interpreting new ideas against the background of historical developments. . . .

"Mountin frequently expounded each and all of the rules of sound administrative organization [democratic, simple, and inexpensive] and used every opportunity to make them living facts in the administration of tax-supported health services. . . . Mountin did not confine his interest to technical matters and questions of methodology. He gave much thought to some of the concepts guiding contemporary health policy and, especially, the theory of separation of preventive and curative health services. . . . [and] was confident the blending of preventive and curative service could be achieved through a complete health program. . . .

"Mountin fought under the flag of faith embroidered with the words: 'Let the welfare of the people be the supreme law.' He never wavered under the fire of those drawing together around the flag of fear. By taking such a stand he acted in conformity with George Washington's maxim: 'Let us raise a standard to which the wise and honest can repair.'"

Field, Laboratory, and Legal Approaches to Treponemata

Reports of new data and new approaches to the syphilislike diseases, yaws and pinta, a review of a laboratory evaluation-guidance program, and a suggestion for reevaluation of premarital blood test laws were heard by APHA members attending the laboratory and epidemiology sections, and by the Conference of State and Provincial Public Health Laboratory Directors.

Pilot Study Should Precede Mass Treatment of Yaws

In treating yaws, a house-to-house canvass where everyone would be subjected to clinical, anamnestic, and serologic examinations would be ideal but is often impossible, impractical, or too difficult, said Charles R. Rein, M.D., associate professor of clinical dermatology and syphilology, New York University-Bellevue Medical Center, New York City.

Any treatment campaign based solely on clinical examination, he said, is limited because persons in the incubation stage of yaws are missed if no clinical manifestations are evident, and it is impossible to detect the seropositive asymptomatic latent yaws patients who ultimately may develop cutaneous relapses, thereby setting up new infectious reservoirs. Also there will be included some nontreponemal disease that will respond to penicillin therapy, thereby causing a fallacious increase in cures. Some nontreponemal conditions which do not respond to penicillin will result in a fallacious decrease in cure rates, Dr. Rein cautioned.

"The number of patients with nonvenereal conditions subject to penicillin therapy would depend on the diagnostic acumen of the clinicians," he said.

Dependence on anamnestic evidence is also fraught with difficulties, he said. "The word soon gets around among natives that they will receive some 'magic medicine' if they state that they have had yaws, and this they will gladly do with the hope that it will cure their bone pains, malaise as well as many imaginary ills."

Serologic Survey

A house-to-house serologic examination would be slow. The interval between serologic survey and institution of treatment would require several days. Some individuals requiring therapy would not be available when treatment teams revisited the houses. This type of survey, Dr. Rein emphasized, would require extensive laboratory facilities to examine the large number of blood specimens and well-trained serologists to evaluate results.

Dr. Rein quoted Dr. H. J. Magnuson as comparing the problems of combating yaws with those in shooting down attacking enemy planes: It is foolish to fill the sky with flak to shoot down one or two planes. Precision-aiming mechanisms, accurately controlled and well-manned, are needed.

It may be feasible to treat entire populations in high prevalence areas without regard to serologic examinations, Dr. Rein explained, but careful serologic examinations with tests known to have high levels of sensitivity and specificity are greatly needed in low prevalence areas. "To date, the filter paper method and the various modifications of the Chediak reaction have not been proven to be of

sufficient sensitivity and specificity as compared to the standard tube or slide tests performed on serum. While the use of capillary tubes for collection of specimens has been found satisfactory in the United States, this would not be a practical approach to the yaws problem," Dr. Rein added.

A simple, inexpensive and yet consistently effective serodiagnostic procedure is greatly needed in low prevalence and underdeveloped areas with inadequate laboratory facilities and insufficient trained technicians, he noted.

Limitations

Without an awareness of the limitations of serodiagnostic procedures in mass treatment campaigns, errors of omission and commission will arise, the syphilologist warned. These chief limitations are false negative reactions, false positive reactions, and seroresistance.

A pilot group with a well-controlled laboratory set up as soon as possible, and preferably before mass therapy is instituted, is important whether or not serodiagnostic procedures are to be employed, Dr. Rein stressed, for it is during the demonstration, survey, and training phase of the pilot program that the laboratory can supply information of value during the later expansion and consolidation of the campaign.

This information should include, he said, darkfield disappearance time following therapy to determine the immediate efficacy of the penicillin preparation to be employed, quantitative serologic tests to note the serologic trend following therapy, and differentiation between relapse and reinfection.

Would Preassess State Laws On Premarital Examination

The marked decrease in the number of syphilis cases reported in recent years, especially infectious syphilis, calls for a reevaluation of

the premarital examination laws as a case-finding and control technique, two California health officials believe.

Philip K. Condit, M.D., and A. Frank Brewer, M.D., of the division of preventive medical services, California State Department of Public Health, offered California's experience during the 12 years, 1939-51, as an indication of what the tests accomplish.

8,100 Cases Since 1939

In California, more than 2 million persons have had premarital blood tests for syphilis since 1939. The tests required by State law discovered 8,100 cases of previously unknown and untreated syphilis, 510 of them primary and secondary syphilis, and about 3,000 in need of further treatment.

Finding infectious syphilis cases and bringing them to treatment to prevent transmission from one marital partner to another to the child is the first objective of the premarital law, Dr. Condit and Dr. Brewer pointed out. Treatment of the other cases discovered fulfills another objective by preventing further progression and disability.

The case-finding returns, however, are diminishing, they found. The number of syphilis cases reported from all sources in California declined 63 percent from 1946 to 1951 for all forms, and 88 percent for primary and secondary syphilis.

Ratio of Infections

Attending the decline in syphilis prevalence is the smaller number of cases discovered by premarital tests, the doctors found. From 1949 to 1951 the ratio of infections to persons tested decreased from 1 in 437 to 1 in 553 for all forms.

The ratio for primary and secondary syphilis decreased by more than 50 percent—from 1 in 2,168 to 1 in 4,836. Thus, the unit cost per case of this type discovered more than doubled during the 3 years, they noted.

In actual numbers the score for

the 3 years stands: premarital examinations, 511,160; all syphilis cases discovered, 1,079 (primary and secondary, 162). Thus a total of the cases found by the premarital tests constituted 3.4 percent of the State total; 32,315 cases were reported from all sources in the State.

Although the 162 infectious cases found was proportionately small, the doctors called attention to the fact that an indeterminate number were prevented by the premarital tests, which served to get medical supervision and treatment for the infected individuals.

Indiana Rates Performance Of Laboratories in State

The goal of a laboratory evaluation-guidance program is to assure in the interest of public health, the best possible service to medical practitioners, Paul Fugazzotto, M.S.P.H., Ph.D., chief serologist of the bureau of laboratories, Indiana State Board of Health, told the Conference of State and Provincial Public Health Laboratory Directors.

The policy of the State health department must be one of active interest, he continued, and the participating laboratories should feel that the health department, or reference center, will guide and help whenever needed. A program that guides rather than polices, and that assists the laboratories to solve problems, is the most desirable, he felt.

Volunteer Participation

In Indiana, Dr. Fugazzotto reported, such a program has resulted in 50 laboratories participating on a volunteer basis, in addition to the 67 approved for making premarital and prenatal serologic tests for syphilis.

Technical phases of the Indiana program, he said, include checktesting of clinical specimens, distribution of control serums, study of reagents, consultation service to laboratories, including the checking of environmental temperatures at which test

reagents are stored and used, review of general techniques and equipment used, and evaluation of serologic test performance.

Deficiencies in test performance of a participating laboratory should be diplomatically but specifically called to its attention, Dr. Fugazzotto continued, with explanation of possible cause and suggestions for remedy or improvement. Technicians often feel that their test performance is not entirely satisfactory and are glad to be told why and what to do about it, he stated.

Causes of Difficulties

Only visits from a trained serologist will discover the cause of most difficulties, the speaker said. Some of these difficulties are due to environmental conditions or failure to follow test specifications, he said, but others are caused by intangible factors which are not described in the literature and "the technician needs someone to tell him where he has failed to consider such factors."

Visual Tests Adequate In Pinta Mass Survey

Pinta may be diagnosed with sufficient accuracy for mass surveys by examination of exposed surfaces of the body, reported Walter F. Edmundson, M.D., associate director, and Sidney Olansky, M.D., director of the Venereal Disease Research Laboratory, Public Health Service, Chamblee, Ga., and Arnoldo Lopez Rico, M.D., chief of the Center of Epidemiological Studies, Rural Cooperative Medical Service, Apatzingan, Michoacan, Mexico. They based their conclusion on clinico-serologic surveys conducted by the Center of Epidemiological Studies in four communities in the Tepalcatepec Basin in Mexico.

The evidence from these surveys indicates that "latent" pinta must be very uncommon, the speakers

stated. Only 4.64 percent of 194 children, 16 years of age or less, clinically diagnosed "no pinta," had either positive or doubtful serologic reactions. In three of the villages, only 2.76 percent of 145 children had reactive serologies. Special efforts were made to study children, Dr. Edmundson and his colleagues explained, in order to differentiate serologic results caused by pinta from those caused by syphilis since pinta is usually acquired in childhood and syphilis, known to be common in the area, in adolescence or later.

The "No Pinta" Group

Of 348 persons of all ages clinically diagnosed "no pinta," 14.37 percent had reactive serologies, the investigators reported. The assumption can logically be made, they maintained, that these reactions were syphilitic reactions, "biological false positives," or residual seroresistance following adequate treatment of pinta. Although the persons in three of the villages were queried as to previous treatment with penicillin or arsenicals, the reliability of their answers is questionable since many of the patients with pinta seemed to feel that an admission of previous treatment would injure their chances of additional medication.

The speakers pointed out also that it is known that lesions of pinta may occur only on unexposed surfaces of the body in about 1 percent of the cases, but they believe their occurrence is probably rarer statistically than the other causes of reactivity mentioned.

Although pinta does not generally cause disabling or killing effects, this disease deserves large-scale control efforts by the nations in which it exists, concluded Dr. Edmundson and his co-workers. The disfigurement caused by the disease interferes with personal freedom and with the development of a healthy outlook on life, they stated. Freedom of choice as to place of habitat, employment, and selection of a mate is drastically curtailed by affliction with pinta.

Professional Training for Pediatricians and Nurses

The well child conference is being used as a key element in the pediatric training of medical students at the University of Washington and in the pediatric residency at the University of Pennsylvania, it was reported to the maternal and child health, public health education, and public health nursing sections.

During a session on "professional education in public health," reports were also heard from Detroit concerning the use of monthly discussion meetings which bring together public health nurses from the health department and maternity service nurses of the hospitals.

Child Health Program Trains Pediatricians

A public health department pediatric training program in connection with its child health program was suggested by Elizabeth Kirk Rose, M.D., and John A. Rose, M.D., as a possible solution to the problem of including experience with normal children in the pediatric residency curriculum. Dr. Elizabeth Rose is chief of the division of child hygiene, Philadelphia Department of Health, and assistant professor of pediatrics, University of Pennsylvania, and Dr. John Rose is assistant professor of psychiatry at the university.

Child health conferences, they noted, provide a group of normal children who can be seen regularly over a number of years. The organization of a training program for pediatric residents in connection with these conferences requires, however, that provision be made for adequate supervision of the residents' work.

The Philadelphia project they described included these features:

Assignment of residents in pairs to the same weekly conference throughout their 2-year training period.

Selection of cases which afforded opportunity for long-time study.

Limitation of appointments for each resident to four during a 2-hour session.

Informal discussion of the cases between the resident and supervisor at each session.

Assignment of a member of the university teaching staff to each session.

Conferences among the supervisors for discussion of the program.

Materials and Evaluation

Materials used in conducting the health conferences included, in addition to the usual medical record form, a sheet on which was noted the development of motor skills and a yearly summary of the child's progress from the first through the sixth year, and a newly designed health record booklet in which notes as to diet, vitamins, and next appointment date were made by the physician and notes of the child's progress and questions to bring up at the next conference were made by the parent.

Evaluation of the program, important to the success of any program, they said, has been obtained from both the supervisors and the pediatric residents. Typical of the supervisors' comments quoted was this one: "It is extremely valuable to have residents involved in this experience while they have access to counsel and expert advice from the staff. It creates interest in good preventive pediatric care. . . . It is a definite contrast to the classic teaching experience with specific

diseases. . . . It demonstrates variability of normal growth and development." Questionnaires circulated among the residents revealed "unanimous approval of this opportunity to associate with well children," they reported.

Nurse Sessions Improve Hospital Maternal Care

Periodic discussion meetings by maternity nursing supervisors and other interested hospital and public health personnel have contributed significantly to the improvement of maternity and infant care facilities and procedures in Detroit hospitals and to a better prepared maternity personnel, reported Garner M. Byington, M.D., Dr.P.H., maternal, child and school health director of the Detroit Department of Health.

Subjects discussed at the meetings included: over-all maternal and child health programs; maternity hospital rules and regulations; venereal disease problems relating to mothers and infants; proper formula sterilization; incubators and their operation; hand-washing facilities; and general cleaning of nursery space. To promote an improved nursing service, copies of the American Academy of Pediatrics' "Standards and Recommendations for Hospital Care of Newborn Infants—Full-Term and Premature," were provided to hospitals lacking them.

Expectant Parent Classes

Since prevention of premature births and the early care of premature infants are of major importance, continued Dr. Byington, classes for expectant parents were established in several hospitals. Postpartum classes have been started also by a few nursing supervisors.

In discussions with hospital and public health personnel the availability of a city ambulance to transport premature infants to properly equipped hospitals was stressed, and approved methods of

preventing infection, correct feeding, providing heat while the baby is in the delivery room, and maintaining heat upon removal to the nursery were discussed.

Dr. Byington stressed the value of the exchange of information and views between hospital and public health personnel. By public health nurses being informed of improved hospital methods, he said, they then are able, in their home visiting, to promote the acceptance of newer techniques of perineal care and the elimination of cord dressings and umbilical bands among mothers who, having had other babies, might resist the "drastic" changes.

Complete Care Accented In Pediatric Training

A complete program of care is accented at the University of Washington's child health center where pediatric training is received by the medical students, reported Robert W. Deisher, M.D., associate professor of pediatrics and director of the center.

Teamwork features the services of a medical social worker, public health nurse, nutritionist, dental hygienist, dentist, psychologist, and psychiatrist as well as pediatrician, he asserted. Conferences with the mother and evening visits to the child's home are included for the student, who may also call on any of the staff when necessary. Also, he visits a preschool nursery. Staff conferences which are moderated by the psychiatrist are also held.

Many students think at first that a well child conference is a health department function. They spend 40 to 45 carefully allotted hours at the center and are able to see the interrelationships of some of the basic principles of pediatrics, public health, and psychiatry. They grasp the functions of each member of the staff as well as what phases other than the physical are significant in following a child's growth and development, he said.

RN-PHN Group Discussion Produces Better Service

In addition to improvement of nursing care of mothers, one real benefit from the monthly meetings of the maternity nurses of metropolitan Detroit is the better understanding and friendship developed among nurses, said Irene Nelson, R.N., director of education at the Women's Hospital in Detroit, Mich.

Encouraged to attend the group sessions are all nurses, students, and others interested in obstetrics, but regular notices are sent to nurses in charge of the obstetrical departments in metropolitan hospitals, the State hospital nursing consultant in the area, and nurses from the nursing division of the Detroit Department of Health and the Visiting Nurse Association.

"The public health nurses attending the meetings are now our friends, and we call upon them when questions or problems arise. I am sure that we had as many questions and problems in the past, but we hesitated, not knowing whom to contact in the public health agency. These meetings are held in different public health stations or centers and hospitals in the city. Tours are arranged so that nurses have a chance to see and learn about the public health facilities and various hospitals," the speaker reported.

Common Understandings

The meetings afford an opportunity to explain changes in hospital techniques, she said. Before these meetings were held, mothers were told by some that babies did not need abdominal binders, although previously they had been told by others that binders were necessary. "We can only decrease a mother's fears and anxieties and make our teaching effective when we teach the same things," she pointed out.

Part II of This Special Section
Will Appear in Our February Issue.

Nursing in Venereal Disease Control— A Suggested Guide

During the past few years there has been a dramatic change in the venereal disease problem in the United States. Control activities have reduced the incidence of syphilis and with newer treatment schedules, therapy can be carried out in clinics or in the offices of private physicians. However, special venereal disease centers are still needed.

These changes require the application of new skills and techniques. This is particularly true of the public health nursing services which will more and more be called upon to assume responsibility for participation in venereal disease control activities.

In response to the expressed needs of health departments, this publication has been prepared as a guide in planning for nursing service in the community in relation to venereal disease. Developed by the nursing branch, with guidance from the medical staffs of the Division of Venereal Disease and the Division of Public Health Nursing, it covers the venereal disease program, public health nursing in the venereal disease program, the clinic, and an evaluation.

The section on nursing includes a discussion of the nurse's responsibilities in case finding, health education, and care of the sick; and the principles, functions, and content of the patient interview. Physical facilities, equipment, and clinic procedures are considered in the third section, as well as follow-up activities in the clinic and in the field.

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Nursing in Venereal Disease Control. A suggested guide. (Public Health Service Publication No. 198) 1952. 27 pages. 15 cents.

Financial Status and Needs Of Dental Schools

Dental education, in common with all other fields of higher education, has felt the impact of accelerating scientific progress and economic change. It is confronted today with the complex problems of maintaining high standards and meeting increasing demands in the face of costs and backlogs of need for space and equipment. In recognition of these urgent problems, the Council on Dental Education of the American Dental Association asked the Public Health Service to undertake an intensive study of the financial status and needs of schools of dentistry.

This report, parts of which were summarized in the October issue of *Public Health Reports*, covers the 40 American dental schools in full operation during 1949-50. The study analyzes faculty resources, operating expenses, separately budgeted research, postgraduate instruction, sources of income, and unmet needs for staff and facilities. Information on operating expenses and income of the 18 schools of dental hygiene in operation during the same period is also included in the report.

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Financial Status and Needs of Dental Schools. (Public Health Service Publication No. 200) 1952. 83 pages; tables, charts. 25 cents.

Distribution of Health Services in the Structure Of State Government

Part Two—General Services and Construction of Facilities for State Health Programs

"Distribution of Health Services in the Structure of State Government" is the subject of a decennial study made by the Public Health Service for the purpose of presenting a picture of total State organization for the provision of health services. The data for the 1950 survey are being published in four parts,

the first of which, "Administrative Provisions for State Health Services," was reviewed earlier. Parts three and four will cover personal health services and environmental health and safety services.

Part two is concerned with the organization, policies, and practices for the provision of general supportive services and construction of facilities for State health programs. The first section is a discussion of the methods by which State agencies supply general technical services which contribute to several of the specialized health programs. Because of the interrelationships among programs, these services have been treated separately, although they do not develop independently, but as parts of the specialized programs which they support.

Another State activity of importance in the total health picture is the program for expansion and improvement of hospitals and health centers. This forms the second section of the discussion, which gives the status of hospital construction programs administered by the hospital authorities of each State and Territory, the District of Columbia, Puerto Rico, and the Virgin Islands as of December 31, 1950.

...

Mountin, Joseph W., Flook, Evelyn, and Mullins, Rubye F.: *Distribution of Health Services in the Structure of State Government 1950. Part Two, General Services and Construction of Facilities for State Health Programs.* (Public Health Service Publication No. 184, Part Two) 1952. 117 pages; tables. 35 cents.

Publications for which prices are quoted are for sale by the Superintendent of Documents, U. S. Government Printing Office, Washington 25, D. C. Orders should be accompanied by cash, check, or money order and should fully identify the publication (including its Public Health Service publication number). Single copies of most Public Health Service publications can be obtained without charge from the Public Inquiries Branch, Public Health Service, Washington 25, D. C.
